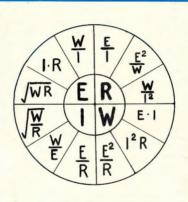
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JULY 1965





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"AMATEUR RADIO"

JULY 1965 Vol. 33, No. 7

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Members of the W.L.A. abouth refer all empirers resulting delivery of "A.B." divest to their Divisional Secretary and not to their Divisional Secretary and not to the Divisional Secretary and the Secretary and the Secretary and the Secretary Secr

Direct subscription rate is 30/- a year, post paid, in advance. Issued monthly on the first of the month, January edition excepted.

OUR COVER

Featured on the front cover is a chart showing voltage, resistance, current and power formulae.

FEDERAL COMMENT

RECIPROCAL LICENSING

The April 1965 issue of the R.S.G.B. Bulletin, both on its front cover and on the editorial page, featured with justifiable pride an official statement that the British Government would grant Amateur transmitting facilities to overseas Amateurs whose governments were prepared to enter into reciprocal licensing agreements.

For some years it has been the policy of this Institute to obtain similar concessions for overseas Amateurs coming into Australia no matter what the proposed period of their stay here.

To some extent this end has been achieved in that U.K. Amateura emigrating to Australia have found the acquisition of a VK licence a simple matter, in many cases the examination requirement being waived.

Certain other nationals, mostly American, visiting tihs country have been granted temporary VK call signs whilst here,

It is pleasing to be able to report that the matter of full reciprocal licensing is now being negotiated between Australia and the United States of America. Such negotiations are, of course, the prerogative of the Foreign Affairs Departments of the two countries and some time may elapse before the agreement is formally ratified.

In the meanwhile we can confidently look forward to the time when we-like our English cousins-can report in "Federal Comment" that the first milestone on our journey towards universal reciprocal licensing has been passed.

Harold L. Hepburn, Federal Vice-President.

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THE MONASH MODULATOR

KEN GREEN, VK3KG

WAS interested to read the article by VK6ZDB in March "A.R." rehalting he concretees with the transport of transport of the transport of transpo

the control of these modulations have been built, in each case plate-modulating a single 807, for use in rural fire trucks, built, and the savisable to avoid the Because it is advisable to avoid the in this application, these rigs employ a two-inch permas, speaker as 6 dynamic mike working into two CCT1 which operates as an emitter-follower to provide a fairly good match into the provide a fairly good match into the provide a fairly good match into the provide and the provide and the provide and the provide a fairly good match into the provide and the

Probably Lady Luck has smilled in our direction, for VKSZDB's trouble of transistor converter hash invading low level audio stages has never raised its ugly head. The power supplies in these mobile fire brigade units are in seperate metal cases, and are sufficiently filtered to suppress the are sufficiently filtered to suppress the quency and the 1600 cycle ripple in output from the rectifiers.

12 volt positive supply line.

cided that the specific using when I decided that the specific using the country was a bit harsh, and the sudio singes were inclining towards a debullet of the country of the country of the country of the billity (noticed particularly when the adjacent 80? was producing r.f.), a adjacent 80? was producing r.f.), a fill the country of the country of the country of the Richard Kellett, the Bod-in-charge of the Electronic Lab. in the Dept. of Physiology at Monash University, to doing? With £2200 worth of double beam cr.o. fitted with differential amplifiers on each beam che with the country of particular of the country of the country of particular of the country of the country of specific and the country of the specific of the country of the c

A drop in distortion was noticed as soon as the collectors of the first two stages were operated from a 9 volt zener supply, this providing a better degree of isolation between stages than any CR de-coupling combination.

However, the modification that really registered an outstanding improvement in stability, and giving a lift in the removal of the resistors and lypass capacitor from the emitter lead of the capacitor from the emitter lead of the tender of the resistor of the resistor and lypass capacitor from the emitter lead of the tender of a 5.8 volt sener to fix the d.c. emitter potential. The extra gain personal control of the potential from the resistor of the resistor freed and the resistor freed a small current from the 12 volt negative from the resistor freed a small current from the 12 volt to the resistor freed and the resistor freed as the resistor freed and the resistor freed and the resistor freed and the resistor freed as a final current from the 12 volt negative freed as a final current from the 12 volt negative freed as a final current from the 12 volt negative freed as a final current from the 12 volt negative freed freed

peaks. Hooray for that cz.o.!
The final change in the circuit was
the addition of a few ohms in series
sistors to bring the two COt's collectors to exactly the same potential in
the no-signal condition. This d.c.
who has built a Williamson amplifer.
This added resistance in one leg is obviously cut-and-try for each set of
transistors, the biggest added value I

As a trial measure, next the OC74 blas current was increased temporarily to bring the output transistors into the Class AB operating region, but as the increased temperature in the output-transistor heat sinks was not accompany to the contransistor of the contr

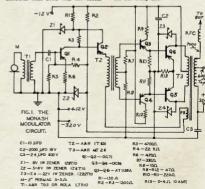
panied by any remarkable performance improvement, the bottom leg of the base voltage divider was changed back to the 10 ohms shown in the circuit diagram. After cycling the 12 volt supply between 9 and 16 volts, with no ill effects, the job was considered complete, and "on-the-air" the received speech quality now compares fayourably with other similar mobile

rigs using valve modulators.

The frequency response is flat from 156 cycles to almost 7 Kc., this figure almost certainly being slightly degraded by the use of this particular type of speaker-mike.

With the accordence apply set to 12.4 could be used to be used to the could be used to the co

In closing I must ecknowledge a debt of gratitude. Again, many thanks, Dick, for your interest and participation in this project, especially in view of the fact that you gave freely two half days of your holiday to open up the University Lab.



^{*} Communications Officer, Diamond Creek Fire Brigade, Vic.

IUNKBOX 2 METRE COMMUNICATOR

W E I DODED . VESADT

HE small mobile portable rig to be described in this article makes no pretence to be the ultimate in v.h.f. emergency equipment. But it Amateurs who have always wanted to operate mobile or portable on the v.h.f hands but have considered that the bands, but have considered that the high cost of power supply components and maybe the small 6 volt battery in the family car are difficult obstacles to overcome

This unit operates from a standard 200 volt 60 mA vibrator sunnly and despite the 15 tubes, consumes no more than 5.5 amps. from a 6 volt battery, operation from a stationary portable location

Controlled carrier modulation is used and the input to the final on voice peaks is 4.5 watts. If a 250 volt supply is used the input could be up to 6.5 is used the input could be up to 6.5 watts on voice peaks without exceeding the 60 mA. rating of the supply. This power may seem to be low but under reasonable conditions several S9 reports have been received over distances of 100 to 200 miles when operating portable in conjunction with a four element beam. Under mobile conditions using a halo-antenna, many good reports have been received up to 20 miles and from high spots, up to 50 miles

The transmitter, which is the main subject of this article, was designed to work in conjunction with an SCR522 receiver. It actually fits inside the re-ceiver in the space from where the squelch and audio components have been removed and makes a compact all but the smallest cars.

The transmitter would be a good verter-car radio combination, with the

nower borrowed from the cor radio supply.

The SCR522 receiver is far from op-

timum as a receiver, but—beggars can-not be choosers. In practice the sensitivity is adequate, but the selectivity is rather poor

is rather poor.

The transmitter and modulator are built up on a standard, commercially available 6 in. x 4 in. x 2 in. aluminium chassis. The r.f. lineup is quite standard except that the 5763 is not the most efficient tube that may be used in the final. It was used because a couple of spares from the home transmitter were available.

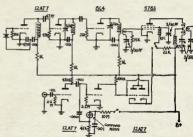
A 12AT7 is employed in a conventional overtone oscillator circuit to obtain 24 Mc. output from an 8 Mc. crystal, and triples to 72 Mc. in the second section of the tube. Coll dimensions are given in the table and the 3-30 pF. concentric trimmers used in several of the tuned circuits are mounted above the chassis to enable ease of tuning when the transmitter is mounted in the SCR522 receiver, and also to prevent crowding of components under the chassis.

The next stage is a 8C4 doubler to 144 Mc This tube was chosen because of its low filament current drain of 150 mA and should provide 1 mA. of grid drive to the final, although the 5763 was found to work quite satisfactorily with as little as 500 microamp, drive. If difficulty is found in used with both sections tied narallel at the expense of several milliamps of h.t. and 150 mA. of 6 volts.

The 5762 final is mounted with the socket suspended sufficiently for helow the chassis so that the ton of the tube projects no higher than the other

Series tuning of both grid and plate circuits is used, and the plate tank of the chassis or below whichever is most convenient for tuning purposes. They certainly provide the most output and quality for the cheapest price. A gain control was considered unceessary and the quality of modulation is governed by the distance of the miles from the mouth

The r.f. section of the transmitter is tuned up with the tuneup switch S1 in the nosition that places screen voltage on the 5763 through the normal screen dronning register The screen voltage will be about 150 volts. When tuning is completed, S1 is put to the modulation position, and the acreen voltage should drop to about 50 volts, and the input to the final will also drop to almost half. By talking into the microphone it will be noticed that the input to the final, and the screen voltage, will kick up to about the original values on voice peaks. The value of R1 determines the stand-



The 5763 needs neutralising in either case, and this is quite simply accomplished with the screen grid method indicated in the circuit diagram.

The antenna coupling link is closely coupled to the centre of the final tank and is tuned with a series 3-30 pF. trimmer

The secret of the modulation system to be described, like all efficiency types of modulation, is that the final be loaded as heavily as possible.

The modulator circuit is straight forward and is about as simple as you can get. No special precautions need be taken with the construction. A plug and tack are used as microphone connectors for the crystal microphone which is a disposals insert mounted in a small adhesive-tape tin. Crystal microphones are not optimum for mobile operation for obvious reasons. but one has been in use here for some considerable time without any trouble.

ing input without speech and some experiment with its value may be worthwhile. Optimum results here were obcircuit diagram, but this could be in-creased to 500K. It will soon be found that after about 90% modulation is reached, speaking louder into the microphone will not increase the level of modulation but will tend to clip or distort on voice peaks.

The tone oscillator is a simple but effective unit based around a neon diode salvaged from a "Command." Operation is controlled by a micro-switch which is mounted in such a position that it can be keved for m.c.w. if necessary.

will not attempt to fully detail the modifications made to the SCR522 receiver because there are many excellent articles available on various con-versions of this unit. The tuning was band spread by pulling out all the plates in the tuning condensers except

*Lot \$9, Orchard St., Mt. Waverley, Vic.

Amateur Radio, July, 1965

one rotor and two double snaced stators in each section and new coils was obtained by ganging the two con-denser shapes together with some dial denser snapes together with some dial cord and a spring, and a vernier drive was mounted on the oscillator condenroy short

The i.f. stages are standard except low filement current consumption of 150 mA. each, and the second stage help with selectivity. A 6H6 is used as a combination diode detector, simple as a compination diode detector, simple

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manufacturing methods are the latest.

a 6SS7 as a pentode audio amplifier driving a 6AM5 in the output. This excellent tube delivers sufficient output and consumes only 19 ma, of ht. and .

A small 5 in speaker was mounted A small 5 in. speaker was mounted behind the front panel, a disposals meter and shunts added to measure battery volts, h.t. voltage, and final plate current, and the front panel was panded aluminium, some typex and indicator labels.

separate switch is used to control the flament voltage to the transmitter, so that when using the remitter, so that when using the re-ceiver section only, such as in fox hunts, there is no unnecessary drain from the battery. A standard wafer switch is used as a T/R switch, and in the transmit position, h.t. voltage is left on the receiver oscillator to mini-mise drift. Also, in a third position, the transmitter oscillator only is switched on to allow checking of frequency in relation to other signals on the band

The antennas are fed with 72 ohm co-axial available cheaply through disposals

This outfit is also quite adequate for low power home station use and at this location runs entirely from the home station converter power supply.

It can be seen that there is ample scope for variation to this transmitter. For 6 metre operation the 6C4 would he omitted and the 5763 which is more efficient at this frequency can then be run at higher input

If 100 to 150 mA, is available from the power supply, a QQE03/12 may be used in the final with inputs up to 18 watts on voice peaks.

COIL DATA

12AT7 Plate, 24 meg.: 20 turns 20 s.w.g. enamel on | dia, slug tuned former

12AT7 Plate, 72 meg.: 4 turns 20 s.w.g. enamel on 4" dia, spaced twice wire diameter

6C4 Plate: 2 turns 20 s.w.g. enamel on &" dia, spaced twice wire diameter. 5763 Grid: 4 turns 20 s.w.g. enamel in i" dia, spaced twice wire diameter. Centre tapped.

5763 Plate: 4 turns 14 s.w.g. enamel dia. spaced wire diameter. Antenna Coupling: 2 turns insulated wire interwound at centre of P.A. fank coil

The keen experimenter should have no difficulty in building up a tuneable i.f. channel and crystal locked converter on a similar sized chassis to the transmitter to make a very compact but efficient station.



MINI-HALO AERIALS FOR MOBILE*

ON TWO AND FOUR METRES-DESIGN, CONSTRUCTION AND ADJUSTMENT

E. POSTANS, G4AC

WHAT the writer considers to be a highly effective, interpensive, a trife tricky to adjust lightweight sears), producing an almost completely to adjust lightweight sears, producing an almost completely for the construction of the completely for the construction of the constructio

In the belief that no aerial can radiate better than almost equally in all directions without forfeit of some other quality. It seemed that a maximum average radiation intensity through 300 reveits, might well become an acceptable guide to final choice for the diameter.

Subsequent testing of these aerials, fixed and mobile, over the 20 odd miles between G4AC, Woodbridge, and

GSFIJ. Colchester, tended to support this view; the optimum diameter proving to be around 8 linches. The 6- and 12-linch types produced about equal carrier levels at the receiver, but, where the pulls, the Schuch and 8inch produced but one insignificant null. In every case the sur. was approximately 1.1 to 1. Since the autumn of 1953, when

Since the autumn of 1953, when these anti-fluter-cum-non-directional experiments commenced, very many /M-to-fixed station and vice versets have been conducted between G3FIJ and G4AC, to establish the facts.

No measurements have been made of signal strengths received /M via the Mini-Halo. In practice, however, its performance appeared at least comparation of the comparat



Mini-Halo aerials for mobile, as evolved by G4AC, ranging from 6 inches to 12 inches in diameter for two metres, and 15 inches for four metres. These aerials were designed and constructed for the tests discussed in his article.

WEATHER EFFECT

Therefore, what the writer had set out to accomplish seemed, in the main, to have been achieved. But there was

chosen. After making up and testing a number of /M serials, final choice for two metres fell to an 8-inch halo, for the reasons now discussed.

Types constructed and tried included 12-inch standard halo, handlehar semi-

Types constructed and tries include 12-inch standard halo, handlebar, seniswattika and turnatile types. All radiated reasonably well, but each produced varying severally, to which was largely attributed the well-known irritating, troublesome "whoof whoof" type futter (as distinct from local change screening effects) on signals received in and from a moving wellche

and from a moving venicle.

On the assumption that these highly
undesirable shortcomings were mainly
due to uneven distribution of current
over the control of the control
over the control of the control
over the control of the control
over the

In each case resonance was achieved by means of a solid dielectric capacity loading section, with built-in trimmer, accommodated within the circular radiator (see photographs), its otherwise open ends being continued diametrically this way current distribution over the shortened radiating length was made less uneven, reducing with decreasing diameter. But where would the optimum

to have been achieved. But there

Radiation patterns for the three serials discussed in his article by G4AC, showing the halo co figuration appropriate to each pattern. These are for the two-metre halo's, at a frequency 1442 Mc., with an a.w. of 1.1:1 exhibited. The gamma matching feeds are 4 in, long with 4.1 ppS series condenser. G4AC claims much improved performance when using these than

* Reprinted from "The Short Wave Magazine," January, 1965.

Amateur Radio, July, 1965

one failing. In wet weather moisture caused an off-resonance condition and greatly impaired performance - reminiscent of 390-ohm ribbon feeder

However, this was eventually eradicated completely by modification of

the loading section.

First, each of the two arms were remade to symmetrically opposite shape contained within the circumference of the halo. The substantially increased length was not easily accommodated and, in spite of nigh perfect resonance and almost 1-to-1 s.w.r., the result was an adverse effect upon the aerial's hitherto non-directional horizontal pattern



Close-up of the solid-dielectric capacity load-ing section, atoual size, on an 8-inch diameter Mini-Halo for two metres, as designed by G4AC.

Further, whilst water mist sprayed on the loading section produced less deterioration than in the case of the solid dielectric type, the s.w.r. was degraded to an unacceptable level. And so, with some progress in one direction, failing was suffered in another. To meet this problem, a new 8-inch diameter radiator was made up with spacing between its loading section arms increased to 1st inches. To each arm was attached a 3-inch diameter capacity disc, capable of being moved along each arm to provide an easy method of resonating.

This time the moisture test showed no adverse effect on s.w.r., which re-mained at around 1.1 to 1. The next question was the all-round performance.

It was air-tested under mobile conditions between Woodbridge and Colchester, and at the same time and place the other halo types were re-tested. At the receiver of G3FIJ this disc-capacity type produced maximum carrier level and an omni-directional effect precisely similar to the results obtained with the best of all types so far tested.

Next, the 18-inch solid dielectric halo for 4 metres was made up and similarly tested, with the same highly satisfactory results. Regularly for many months the 8inch solid dielectric type has been operated by G3FIJ and G4AC, both using 6J6 n.a. Tx's and 6AK5 r.f. Rx's with extremely satisfactory—and inregulte

G3LOR has also contributed with helpful reports from time to time. One QSO worthy of note was an absolutely solid cross-band duplex Phone contact, with G4AC/M on two metres and G3LQR on 4 metres over a range 26-28 GSLLM on 4 metres over a range 28-28 miles, reducing to 18 miles or so at the QTH of G4AC, including passage through forest, riverside roads and narrow streets in built-up areas. The r.f. output at C4AC/M was approximately 1½ watts to aerial, the arrange-mately 1½ watts to aerial, the arrangement shown in the photographs.

maintained-except in wet weather, as already described. Bringing the disc type to resonance

is on the same lines. If provision can be made for one of the discs to be rotatable on a slightly

off-centre single-bolt fixing, a useful trimmer results.

For anyone wishing for the quickest, simplest possible approach to this design-but not by any means the bestarms (flat dural) as already described. merely create the capacity section then drill and tap one arm as close as possible to the rim gap. Accurately opposite this hole drill another in the other arm of a size to accommodate an end plug from a BiC ball-point pen



CONSTRUCTION

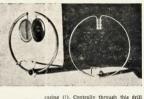
meter to the GAAC d showing solid and air lectric capacity lo (left). These seriels

The photographs should be self-explanatory, However, designs of this nature involve so many inherent variables, which are almost certain to differ aerial-to-aerial, that, in the writer's If aerial-to-aerial, tnat, in the writer's view, it is not possible to provide completely reliable measurement. For probably will be) 8 inches diameter more or less. Consequently, the load-ing section, which is generously accommodating, will be varied accordingly, GAGCs version is 1½ inches in length and G3FIJ's is one inch. Similarly, if the junk-box contains a couple of discs a bit less than 3 inches in diameter, by all means use them and adjust spacing accordingly.

Nevertheless, a few notes may be helpful. For easy reference the three main aerials are numbered: 1—Solid dielectric type for two metres; 2-Disc type for two metres; and 3—Solid die-lectric type for four metres. These are given in the Appendix.

ADDISTMENT

Having made the solid-dielectric type loading section arms, say, a half inch longer than expected to be necessary, and a gamma match to radiator that can be easily varied, then with the feeder attached and an s.w.r. indicator in circuit, gradually reduce the length of the loading section. As resonance is approached adjustment will become more critical and sensitive as s.w.r. Final adjustment and trimming of the loading section and gamma match will be found to be inter-dependent, and eventually a very low s.w.r. can be secured. Once gained, resonance should be positive and easily



a clearance hole (6BA). Insert a 6BA bolt, screw it into the opposite arm and thus one has a widely variable having been brought to resonance, very easily kept on the nose. But this arrangement will not tolerate more than a watt or two of r.f. input

APPENDIX Dimensions for 2-m. and 4-m. Mini-Halo (1) (2) (3)

Radiator diameter 8 Radiator material Capacity-disc diameter Total length, capacitysection arms 31 Capacity-section, dieectric length 2** 11 Capacity-section, arm 3/16

diameter Gamma match, centre

mast to radiator connection

11 Feed point connection Notes: All dimensions in inches, is for 2 m., solid dielectric; (2) is for 2 m. with disc reconstor; (3) is for 4 m. with sol dielectric. Where marked " use % inch is dural curtain valance rail. " this is continue out 5 in. to provide anchorage for stabilistic pracket. Feed impedance in each case is "

TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.

TUNNEL DIODE AMPLIFIERS*

With a practical design for a Parallel Amplifier on 70 cm

SVEN F. WEBER, B.Mus., L.R.A.M., G6SFW'T, G8ACC

TUNNEL diodes have been available at a reasonable price for some years. They have been talked about for even longer, but the fact remains that the average Amateur has very little idea of the potentiality of these most extraordinary products of semi-conductor research; and this in spite of the fact that tunnel diode cir-cuits are almost ridiculously simple (at least on paper) and that results are very easy to achieve.

very easy to achieve.

One of the factors which has the largest effect on semi-conductor action to the factor of t ductor in the reverse direction. This degree of "doping" is said to make the semi-conductor "degenerate."



Fig. 1. Plotting current against applied voltage to a tunnel diode.

The fact that the reverse breakdown voltage drops to zero is not by any means all that happens. If degenerate p and n semi-conductor materials are brought together under very carefully controlled manufacturing conditions to make an extremely abrupt junc-tion, of the order of 150 A in thickness, the forward characteristic is also af-* Reprinted from "RSGB Bulletin," Feb., 1965.

fected. Drawing a graph of current against voltage, one obtains a curve similar to Fig. 1. Starting from zero volts across the diode, the current at first increases more or less linearly in the forward direction. At about 55 mV though, the current levels off and then starts to decrease until at 350 mV (for Germanium) it reaches a minimum and again starts to climb-more as one would have expected from a semiconductor diode.



Fig. 2. A.c. resistance plotted against voltage

Looking at this graph a bit more closely, the slope of the curve at any point is a measure of the diode ac-resistance, and this can again be plotted

against voltage as in Fig. 2 against vottage as in Fig. 2.

The really interesting part of this graph is the central portion where the curve is negative. What does this mean or imply? By definition, any ordinary resistor dissipates power when current flows through it. It follows then, that a negative resistance will generate power; in fact, current flow-ing into it will be out of phase with current leaving it. Impossible? Re-member that this is not a resistance in the d.c. sense; it is an a.c. resistance of a valve; a negative incremental resistance. Put this negative resistance



in series with or in parallel with a load and the possibility of power gain will become more evident. Let us take the series case first. If a voltage V is applied to R, and R, in Fig 3, V is applied to R and Rs in Fig. 3, and the voltage across Rs is measured, it will be found to be IRs, where I is the current due to V through both resistors. V equals $I(R_1 + R_2)$, and therefore the "gain," that is, $\frac{V_{\rm est}}{V_{\rm est}} = \frac{R_8}{R_8 + R_2}$

 $\frac{v_{\rm est}}{V_{\rm ta}} = \frac{n_{\rm t}}{R_{\rm t} + R_{\rm s}}$ and, if $R_{\rm s}$ is negative, the result can be greater than 1. It can even approach infinity if the two Rs are equal. The parallel case is just as obvious though in this case it is better to work with conductances (reciprocal resistances) as in Fig. 4. If source and load conductances are equal then the source current splits equally between the two halves of the circuit, the power of the



Fig. 4. (a) Positive conductances in parallel; (b) Positive source and load conductances in parallel with a negative conductance.

load is 10 and the power gain cannot be greater than 1. If the load is paralleled by a negative conductance, then current in this section will be out of phase with the driving current. That is, the negative conductance acts as an additional source and supplies additional current to the circuit. Load current can now be greater than and power gain exceeds 1. The power

 $\frac{P_{\text{out}}}{P_{\text{in}}} = \frac{4g_{\text{s}}}{(g_{\text{s}} + g_{\text{L}} - g_{\text{D}})^{\text{s}}}$ which can again approach infinity, as can be seen by making the source and load conductances together equal the diode conductance,

Amateur Radio, July, 1965

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Drawing a curve for the parallel case, plotting "resultant" impedance against source impedance, all other chings being equal, leads to the odd-inight being equal, leads to the odd-interestance is increased towards the value of the diode resistance, the resultant, and the source is equally flowing through the source in equally flowing through the source in equally flowing through the source in equal to the diode and the resultant, than would appear across the source. Increase the source resistance above that of the diode and the resultant infinity and drops towards a value could to the diode negative resistance. Such and this is important, the resultant and the supportant, the resultant cannot be considered with collision of the control o



Fig. 5 Resultant resistance for negative (diode) and positive resistances in parallel.

Let us now look at the diode itself a bit more clearly. There are warranged explanations of its physical operation (1, 2, 3), but there are by operation (1, 2, 3), but there are by the constraint of the constra



Fig. 8. Equivalent circuit of funnel diode for

a.e.
Total impedance across the terminals:

$$Z_M = fuL + \frac{1}{fuC + |g|} + R$$
 ,...(1)
= $fuL - \left[\frac{fuC + g}{fuC^2 + g^2}\right] + R$

Equating real and imaginary parts: $Z_r = \frac{-F}{(\omega C)^2 + F^2} + R \qquad \dots, (2a)$ $Z_r = \int \omega \left[L \quad C \quad C \quad \dots (2b) \right]$

At frequencies we can call "resistive cut-off" and "solf resonant" respectively, these will become zero: i.e. $R = \frac{g}{(w_{c}^{2})^{2} + g^{2}} \cos f_{r} = \frac{g}{2\pi C} \sqrt{\frac{1}{R_{g}} - I}$. (3a)

i.e.
$$R = \frac{C}{(aC)^2 + g^2}$$
 or $f_r = \frac{g}{2aC}\sqrt{\frac{r}{Rg} - I}$. (3a)
and $I = \frac{C}{(aC)^2 + g^2}$ or $f_r = \frac{I}{2a}\sqrt{\frac{I}{LC}}\cdot \frac{g}{(C)^2}$...(3b)

The implications of the two equitions we have ended with are quite simple. The resistive cut-off frequency, I, is the frequency above which the cut-off cut-off cut-off cut-off cut-off duced to zero, and the self-resonant frequency f, decides the normal maximum frequency of oscillation. Let us put to the cut-off cut-off cut-off cut-off cut-off the cut-off cut-off cut-off cut-off cut-off the cut-off c

g = 6.6 mmho.
C = 5 pF nominal.
L = 1 maH with leads clipped very short.

R = 1.5 ohm.

which gives f, as 2100 Mcs., and f, as 1300 Mcs. So there is obviously some u.h.f. possibility in these devices.

Looking a little more closely at the two equations and remembering that L, C and R can be added externally, if f, is lower than f. then the device will want to oscillate. If it is higher, then it will amplify, so:

$$\begin{array}{c} \frac{1}{2\pi}\sqrt{\frac{\gamma}{LC}-\left(\frac{\pi}{C}\right)} > \frac{\pi}{2\pi}\sqrt{\frac{\gamma}{Rg}-1} \\ & - \frac{L_g}{2\pi}\sqrt{\frac{R}{Rg}-1} \\ & - \frac{L_g}{Rg} < \frac{R}{Rg} > L_g|C \end{array} \tag{4}$$
 Also for real values of f :
$$\begin{array}{c} \frac{1}{Rg} > 1 \\ & - \frac{1}{Rg} > R \end{array} \qquad \tag{5}$$

Combining these two censits gives: $\frac{l}{s} > R > Lg/C \dots (6)$ and any successful amplifier must satisfy these conditions. Actual gain is determined by matching source and load conductances to that of the diode.



Take a practical case: a series amplifier for 163 Mes. (see Fig. 7). Here the source, diode and has predictions of the source, diode and has predictions of the series of

$$R = \frac{R}{(46C)^2 + R^2} \Rightarrow$$

$$(2\pi \times 145 \times \frac{66 \times 10^{-3}}{10^{2} \times 5 \times 10^{-10^{2}} + (66 - 10^{-3})^{2}} = \frac{101 \text{ obset}}{101 \text{ obset}}$$

Impedances external to the diode will account for 80 ohms, the diode for 1.5 ohms, leaving 21.5 ohms to be supplied in the form of a non-inductive resistor. Now for the series inductance. Lg/C must be just less than R (at all frequencies), and working this out gives a figure of $78 \, m_{\mu} H_{\gamma}$ of which up to $12 \, m_{\mu} H_{\gamma}$ can be accounted for in the diode leads.

So the design is simply 40 chms source and load, 2,15 chms series resistance and 0.078 eH sories inductance. If the source and load also happen to the same season will have been mat, or the close season will have been mat, or the close of amplifier can give a steady 30db and 1.00 cm. The control of the control of amplifier can give a steady 30db and 1.00 cm. The control of amplifier can give a steady 30db and 1.00 cm. The control of amplifier can give a steady 30db and 1.00 cm. The control of a control of the c

It may, of course, be objected that he aerial and receiver impediances are not known securately esough. This may be not known securately esough. This may be not the design impediance, and provide the securate of the securate of the securate that the securate that

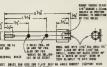


Fig. 8. A practical tunnel diode amplifier circuit for 145 Mes.

Now, a parallel amplifier. At u.b.f. the parallel amplifier is by for the parallel amplifier is by for the parallel amplifier. So for the parallel amplifier is by for the parallel amplifier. The parallel amplifier is the parallel amplifier. The parallel amplifier is the parallel amplifier. Several quarter-wave co-oxidi line. Several quarter-wave described from the parallel amplifier. Several quarter-wave which are noteworthy for their seven which are not enough the parallel as far as the Amateur user two diodes across a strip-line coupled hybrid to give a gain of up to 25 Mer. (4), which is all very well until on discovers the price of a strip-line discovers the prices of the prices of

DESIGNING A TYPICAL AMPLIFIER

The centre frequency of this unit is to be 435 Mcs. (a wavelength of 68.88 cm). Tunnel diodes usually have a capacitance of around 5 to 10 pF, and this varies between samples, so far a parallel amplifier of reasonable length, appear the best. Using commercially available § in brass channel of 16





y 18. 9. (a) Details of the 16 in diam. centre line; (b) A TO18 tunnel dock base. Pira and 2 are the positive slectrods, counceled together the control of the council of t

awa, with a in lid and a in dismeter centre rod, the line impedance is getting on for 60 ohms. With a line of the line is getting on the line is a second of the line is a line in the line to reconsuce. This gives a choice of a design capacity of about 5 pf. the 13286A has about 8 pf. All three its. However, the conductance of the first two is 6.5 mmbo (180 ohms), the 13286A is 18 mmbo (180 ohms), which seems a better proposition (remember like it source, and is a second of the constant of the remember like it source, and is of the constant of the contraction of the constant of the contraction of the contractio

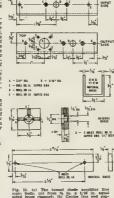
The 1N2898A diode will want to see an admittance of 18 mmho at its end of the line. This will be made up of two parts: that of the serial and that of the receiver, both transformed by their respective positions on the line. From considerations of noise, the receiver



or shart spring chip lane wire shaped to one end to fit in t The other end clips crews, either top or output should be "undermatched," so its tapping point will be further down line than the aerial point. shall allow a bit over 5 mmhos for the receiver and 10 mmhos for the aerial as seen at the diode. If each has an actual conductance of 13.3 mmhos (75 ohms impedance) it is now easy to calculate where the tapping points should be. The line admittance at any point is directly proportional to the cotangent of the phase angle at that point (this sounds awful: all it means is that the line impedance follows a tangent curve), but for a length of line so short in relation to a quarter wavelength, the change can be taken as approximately linear. The receiver approximately linear. point will be at $\frac{5}{13.3} \times 5$ cm = 1.9 cm, 10

and the aerial at $\frac{10}{13.3} \times 5$ cm = 3.8 cm. That completes the theory. We now

have a 60 ohms trough line made of $\frac{3}{2}$ in. square channel and $\frac{1}{2}$ in. rod centre conductor, tapped at 1.9 and 3.8 cm from the shorted end, and with a 1N2969A diode doing all the work.



mustic body, cut from % In. x 1/18 In. equaldided braze channel; (b) Derrite line end support paths, which should be brazed into poinport paths, which should be brazed into poinfer the capsetder (freed-through) plate are the same, with the exception that the centre the same with the exception that the centre the same with the exception that the centre of the same with the exception that the thin the plate round in the same read to accept this end plate round not be noblered into the

CONSTRUCTIONAL DETAILS

The materials required consist of 3 in, of square section 16 & w.g. 2 in, brass channel, lengths of 1 in, x 3/16 of 1 in, x 3/16 of 2 in, brass rod, and a few tinches of 2/16 in. brass rod, and a few tinches of 3/16 in. brass rod, and a few tinches of 2/16 in. brass rod, and no needed are a 2 BA brass washer and a 1000 by feed-screen, etc. Drilling details are given in the diagrams. To tay 8 BA threads, use a number 51 drill, for TA BA threads, or a number 51 drill, for TA BA threads of the 3/16 in. x 50 tp.1 model engineer's tap, an 11/64 in. drill. A number 44 drill can be used for a hole to

The centre red is cut to 5.2 cm, and will be recessed in its end plate by 1 mm. To make the socket for the diode at the end of the red, first drill with a number 44 for a short distance, making certain that it is dead centre. Then re-drill with a 3/16 in. drill to a depth of 1 in. Assuming that the drill has gone in centrally, then make three up the edges, with a saw and clean up the edges, with a saw and clean up the edges, with a saw and clean

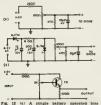
The tuning condenser is a little more difficult. Cut a § in square summer difficult. Cut a § in square summer difficult. Cut a § in square summer difficult cut a § in square summer difficult cut a fine square summer difficult cut and tap with the 3/18 in. x 80 tp.1 taper summer descript does 17.1 The four taper summer difficult cut and the summer difficult cut for accordance of the 3/16 in. The summer difficult cut for accordance of the summer difficult cut for a summer difficult cut for

When all the parts are ready and clean, fit them together and braze the clean, fit them together and braze the second to the control of the c

POWER SUPPLY

Tunnel diodes work at very low voltages, and ains, as they are majority-current devices, this junction crossing the state of the state

is accidentally reversed. A supply is therefore needed to give up to 350 mV, and it should be apparent from our equations that the diode bias supply must also be of equal or lower impedance than the diode, which is 63 ohms in this case. If it is not, the diode will simply switch itself permanently (or bi-stably, depending on circuit inductance) into a high or low voltage state (points C or A in Fig. 1). To get stable operation at point B, the blas supply load line must cross the curve at one point only; in other words, be of lower impedance than the diode. It may also be noticed that diode. It may also be noticed that stray inductance, even when bypassed by 1000 pF (remember L < Rg/C), could prove troublesome. For this reason use a 28 pF decoupling electro-lytic immediately across the 1000 pF bypass. The bias supply can be obtained in many ways: from batteries or other voltage sources via Zener diodes, from forward biased junction diodes or even series regulating n-p-n transistors. The last method has the slight advantages of lower current



PM_22 (a) A simple battery operated bias apply: (b) A simple battery operated bias apply: (c) A series regulated translator supply supply: (c) A series regulated translator supply supply was used in the prototype amplifier TM use used in the prototype amplifier TM use in the prototype amplifier TM used to the use of the prototype amplifier TM used to the prototype am drain from the battery and a higher

value variable resistor for control— low resistance carbon track pot's are rather difficult to obtain. Against this must be set increased cost and com-plexity. Still, providing that, in this case, the tunnel diode sees a source of no more than 60 ohms, all will be well as far as biasing is concerned. . Drain is very low: at the optimum setting the diode will use only about 1 mA. maybe the bias supply can afford to lose a few more to get the required low impedance.

ALIGNMENT

Alignment is simple. Using a sensitive volt meter to measure the voltage across the diode, increase this to about 200 mV. Plug in aerial and receiver and search for a medium-strength signal. Tune up the amplifier whilst gradually reducing the bias. The sig-nal will increase considerably in strength without, in most cases, much increase in background noise. In all probability the unit will oscillale before 130 mV. (the point of maximum conductance) is reached; this only means that the aerial and receiver impedances are not quite what you thought they would be. It does not matter though: pretty high gain will be available before it goes off the deep end, as the diode, on some part of its characteristic, can match anything provided it is of lower conductance than the diode maximum. It will thus oscillate when it over-matches. If the gain goes through a maximum the gain goes through a maximum and then drops off, the aerial and re-ceiver impedances are less than 75 chms. However, even with 50 chms source and load, the maximum available gain would still be of the order of 13db.

NOISE, GAIN AND OTHER POINTS

The tunnel diode negative resistance shows shot noise as does any resistance, but the noise temperature is of the order of 300° K only, which is much better than either a valve or a transistor, though not as good as a parametric amplifier or a maser. poise is also frequency dependent to the extent that as one approaches the cutoff frequency, the noise figure gets worse. However, even at a frequency of 1/3/2 of f., the noise figure is only 6db. At medium frequencies (in the 400 Mcs. range) a noise figure between 3 and 4db can quite essily be obtained (5).

For the particular circuit configura-tion shown, the calculated gain-bandwidth product is around 300 × 10° c/s and this appears to agree quite well with results obtained in its use, as does the calculated noise figure mentioned above. One can literally choose the value of gain to suit one's own convenience, the limit being set by what bandwidth is required and the difficulty in holding it stable with very high values. 30db is possibly an effective limit.

As mentioned before, tunnel diodes do not like being overloaded in any way. Up to a point they have a builtin agc. action (this follows from Fig. 1), and this non-linearity can produce some most curlous spurious responses from out-of-band local T.V. transmitters. But it will not cope with a transmitter feeding it with a few watts; both input and output sides must be well shielded from strong r.f. fields, and it is a good idea to place a 75 ohm dummy load across the input when the aerial is removed. So be careful!

Other than this they are very useful and reliable little devices which work with the minimum of fuss, provided a few simple precautions are observed (i.e., series inductance and bias impedance, stray r.f., etc.). It is quite possible to extend the operation of a parallel am-plifier to 1290 Mcs. with an S-band diode, where its noise figure would still make it worthwhile. Their main disadvantage, that they cannot readily be cascaded, is of no consequence to the Amateur. Try one and see how easy it is.

- REFERENCES (1) "GE Tunnel Diode Manual" (GE, New York,
- "GE Tunnel Diode Manual" (GE, New York, 1961).
 "Radio Constructor," Nevember, 1968.
 "Tunnel Diode and Semiconductor Circuits" (Carroll MeGraw-Hill)
 "Proc. IRE," July, 1969, p. 1221.
 NEC Convention Record, 1969.

160 METRE DX AND THE 169 YEAR CYCLE"

(With credit to George Jacobs, W3ASK, "The Sunspot Story, Cycle 19, the De-clining Years." Available through CQ. One dollar.)

The maximum smoothed sunspot number ever recorded in any sunspot cycle was 201.3, in March, 1958. The lowest ever recorded was 3.3, in April, 1954. The 11 year cycle varies between an average maximum of 140 and an average minimum of 10. Additionally now, it is quite certain, based on some good short term records and long term computations, that these 11 year cycles are superimposed upon a long slow 169 year cycle, such that maximum sunspot numbers increase and decrease rather slowly over a longer 169 year period. what is of particular importance and interest to 180 DXers is that we are now at the low point of this 189 year cycle, and since 160 conditions are better the lower the sunspot number, it means that, since the sunspot numbers will rise slowly for quite a few years, we should enjoy 180 DX quite a lot longer than we ordinarily would. For example, the low 1964 number will hover around 9, 10, 11, 12, 16, 18, and conditions have been quite good. In 1985 (IQSY) the lowest numbers are estimated to be between 5 and 9; 1966, back to about 15-25; 1967, back up to 20-40; 1968, 40-50; with the maximum at the peak of next 11 year cycle being possibly not over 60, or even

The next 11 year cycle following that The next 11 year cycle following that might not exceed a smoothed number of 78, either. In fact, S. G. Luts, of Rughs Research Labs., predicts numbers will not go over 75 for the balance of the century, or until the year 2000, and will probably average around 401. Think of it Not over 40, when the maximum has the result of the control lots more happy hunting on 160 for some time. We are sorry for the h.f. boys, of course, but we 180ers will thankfully make the most of our golden opportunity.

Why is 180 better the lower the sunspot number, which means lower ionisagreater the ionisation, the greater the signals and conversely the lower the ionisation (low sunspot numbers), the less absorption and the greater the re-flection of LF 160 signals for DX pur-poses. Interesting? Good theory? Let's all make the most of it—and b.c.n.u. as usual on 160.

Happy IQSY's-1965 and 1966. -Stew W1BB.



R.F. RATINGS FOR T.V. DEFLECTION VALVES

TYPES 6DQ6, 6GW6, 6GT5, and 6JB6

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and RF Power Amplifier—Class FM Telephony

Maximum Batings, Absolute	Values:
DC Plate Voltage	750 volts
DC Grid No. 2 (screen)	
Voltage	250 volts
DC Grid No. 1 (control	
grid) Voltage	-150 volts
DC Plate Current	140 Ma.
D.C. Grid No. 1 current	3.5 Ma.
Grid No. 2 input	3.0 watts
Plate Dissipation	20 watts
Peak Heater-Cathode Vol-	
tage:	
Heater Negative with	
respect to Cathode	135 volts
Heater Positive with	
respect to Cathode	135 volts
Bulb Temperature (at hot-	
test point on bulb sur-	
(nan)	240*0

Piate-Modulated RF Power Amplifier
—Class C Telephony
(carrier conditions per valve for use with a maximum modulation factor of 1.0)

Maximum Ratings, Absolute	Values:
	ICAS
DC Plate Voltage	600 volts
DC Grid No. 2 (screen)	
Voltage	250 volts
DC Grid No. 1 (control	MOO YOULD
grid) Voltage	****
grid) voltage	-100 Aotte
DC Plate Current	TTO MS.
DC Grid No. 1 Current	
Grid No. 2 input	2.0 watts
	15 watts
Peak Heater-Cathode Vol-	
tage:	
Heater Negative with	
respect to Cathode	135 volts
	199 Apiff
Heater Positive with	
respect to Cathode	135 volts
Bulb Temperature (at hot-	
test point on bulb sur-	
face)	240°C

cuit Redistance 33,000 ohms

AF Power Amplifier and Mediulator—Class ABI
Maximum Ratings, Absolute Values: ICAS
DC Plate Voltage 750 volts
DC Grid No. 2 (screen)

Maximum Grid No. 1 Cir-

Maximum Grid No. 1 Cir-

DC Plate Voltage	750 volts
DC Plate Voltage DC Grid No. 2 (screen)	
Voltage	250 volts
Max. Signal DC Plate	
Current	125 Ma.
Max. Signal Grid No. 2	
Input	3.0 watts
Plate Dissipation	20 watts
Peak Heater-Cathode Vol-	
tage:	
Heater Negative with	
respect to Cathode	135 volts
Heater Positive with	100 1010
respect to Cathode	135 volts
Bulb Temperature (at hot-	199 Antos
Buib Temperature (at not-	
test point on bulb sur-	
face)	240°C

cuit Resistance 0.1 megohm

TYPES 6DQ5, 6GX5, 6JE6
RF Power Amplifier and Oscillator—
Class C Telegraphy

RF Power Amplifier—Class C FM Telephony Maximum Ratings, Absolute Values: TOAR DC Plate Voltage DC Grid No. 2 (screen) 758 volts Voltage Voltage
DC Grid No. 1 (control grid) Voltage
DC Plate Current
DC Grid No. 1 Current 175 volts -150 volts 280 Ma. 3.5 Ma. 3.5 watts Grid No. 2 Input 32 watts Heater Negative with respect to Cathode Heater Positive with 135 volts Heater respect to Cathode ... Bulb Temperature (at hot-135 volts

Maximum Grid No. 1 Circuit Resistance 33,000 ohms Plate Modulated RF Power Amplifier—Class C Telephony (carrier conditions per valve for use with a maximum modulation factor of

250°C

test point on bulb sur-

1.0) Maximum Ratings, Absolute Valu TCAS. DC Plate Voltage DC Grid No. 2 (screen) 600 volts Voltage 175 molte DC Grid No. 1 (control grid) Voltage
DC Plate Current -150 volts 230 Ma. 3.5 Ma. 2,3 watts 21 watts D.C. Grid No. 1 current Grid No. 2 Input Plate Dissipation Peak Heater-Cathode Voltage: Heater Negative with respect to Cathode Heater Positive w 135 volts Heater with respect to Cathode 135 volts

DC Plate Voltage DC Grid No. 2 (screen) 750 volts Voltage 175 volts Max, Signal DC Plate Cur-286 Ma. Max. Signal Grid No. 2 Input 3.5 watts Plate Dissipation 32 waits Peak Heater-Cathode Voltage: Heater Negative with respect to Cathode 135 volts

respect to Cathode 135 volts
Heater Positive with
respect to Cathode 135 volts
Bulb Temperature (at hottest point on bulb surface) Crid No 1 Cir.
Cull Resistance 100 respectively for the concull Resistance 100 respectively for Section 100 res

Wireless Institute of Australia

The institute was founded in 1916 to premote interest in Amateur Radio. Today each State has its own Division, responsible for intrestente matters.

Any purson with an interest in Amaieur Radio, including Short Wave Lideaning, may join the Institute; it is not measured to possess a frammitting

car Madie, including where Wave Lajeaing, may join the Engithtie; it is asi mosessary to pessees a transmitting license.

Enquiries for membership should be made to the Secretary in the respective Siste, addresses are as follows:—

Enquiries for membership should be made to the Serretary in the respective State, addresses are as follows:— New South Wales: 14 Atchison Street. Crows Neat.

Street, Crows Nest.
Victoria: P.O. Box 38, East Melbourne, C.S.
Queensland: Box 638J, G.P.O., Brisbane.

South Australia: Box 1284K, G.P.O., Adelaide. Western Australia: Box N1002, G.P.O., Perth. Tasmania: Box 851J, G.P.O., Hebert.

The W.I.A. also provides various aides for Amateurs and these are available from the Victorian Division, or other State offices.

STATION LOG BOOK OR S.W.L. LOG

Size 10" x 8", with pages ruled to provide all essential requirements for Ameteur Stations or Short Wave Listeners, Available for 7/6 including postage.

LOG SHEETS

Specially ruled sheets for Field Day or Portable Station operation. Besically as the Log Book above be includes requirements for the Federal Contest Committees. Available for 3/6 for fifty sheets, plus portage.

AUSTRALIAN RADIO AMATEUR CALL BOOK

The only directory of all registered Australian Amateur Radio Stations and Short Wave Listeners. Contains current details of DX Countries List, Prefixes and Zones. Issued yearly and available for 6/- each.

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The only hobby magazine devoted entirely to Amateur Radio, Short Wave Listening, news, views, and construction articles. Available on direct subscription from the Victorian Division for 38/- a year post free.

INVITE YOUR FRIENDS TO JOIN THE W.I.A. TODAY . . . and become one of the members. Remember that you receive a free copy of "A.R." with your sub-

scription.

REMEMBRANCE DAY CONTEST, 1965

A perpetual trophy is awarded annually for competition between Divi-sions. It is inscribed with the names of those who made the supreme sacrifice, and so perpetuates their memory throughout Amateur Radio in Austra-

The name of the winning Division each year is also inscribed on the trophy and in addition, the winning Division will receive a suitably inscribed Certificate.

Amateurs in each Call Area, includ-ing Australian Mandated Territories and Australian Antarctica

will endeavour to contact Areas. In addition, Ama-teurs will endeavour to contact any other Amateurs on the authorised bands above 52 Mcs. (i.e., intra-state contacts will be permitted in the v.h.f./u.h.f. bands.)

Contest Date

0800 hrs. G.M.T., Saturday, 14th August, 1965, to 0759 hrs. G.M.T., Sunday, 18th August, 1965. All Amateur Stations are

requested to observe 15 minutes' silence before the commencement of the contest on the Saturday afternoon, An appropriate broad-cast will be relayed from all Divisional Stations during this period.

BOXES

1. There shall be five sections to the Contest:-(a) Transmitting Phone. (b) Transmitting C.w. (c) Transmitting Open. (d) Receiving Open. (e) Transmitting Open--

v.h.f./u.h.f. only. 2. All Australian Amateurs may enter the Con-

are fixed, portable or mobile. Members and nonmembers will be eligible for

3. All authorised Amateur bands may be used but cross-band operation is not permitted.

4. Amateurs may operate on both Phone and C.w. during the Contest, i.e., phone to phone or C.w. tu C.w. However, only one entry may be sub-mitted for sections (a) to (d) in 1. A separate entry may be submitted for section (e) in 1. An open log will be one in which points are claimed for both phone and C.w. transmissions. Refer to Rule 11 concerning Log en-

5. Only one contact per station per band is allowed. However, a second contact can be made on the same band using the alternate mode. schedules for contacts on other bands are prohibited.

6. Multi-operator stations are not permitted. Although log keepers are permitted only the licensed operator is allowed to make contact under his own call sign. Should two or more wish



to operate any particular station, each will be considered a contestant and must submit a separate log under his own call sign. Such contestants shall be referred to as "substitute operators" for the purposes of these Rules and their operating procedure must be as follows:-

Phone: Substitute operators will call "C.Q. R.D." or "C.Q. Remembrance Day" followed by the call of the station they are operating, then the word "log" followed by their own call sign, e.g., "C.Q. Remembrance Day sign, e.g., "C.Q. Remembr from VK4BBB log VK4BAA.

C.w: Substitute operators will call "C.Q. R.D. de" followed by the group call sign comprising the call of the station they are operating, an oblique stroke and their own call, e.g., "C.Q. R.D. de VK4BBB/VK4BAA."

Contestants receiving signals from a substitute operator will qualify for points by recording the call sign of the substitute operator only.

7. Entrants must operate within the terms of their licences.

8. Cyphers—Before points may be claimed for a contact, serial numbers must be exchanged and acknowledged. The serial number of five or six figures will be made up of the RS (telephony) or RST (C.w.) reports plus three figures, that will increase in value by one for each successive contact. If any contestant reaches 999 he will start again with 001.

9. Entries must be set out as shown in the example, using ONLY ONE SIDE of the paper and wherever possible standard W.I.A. Log Sheets should be used. Entries must be clearly marked "Remembrance Day Contest 1965" and must be postmarked not later 1985" and must be postmarked not later than 6th September, 1985, Address them to "Federal Contest Manager, W.I.A., G.P.O. Box N1602, Perth, W. Aust. Late entries will be disqualified.

10. Scoring will be based on the table shown. A bonus of 25 points may be claimed for the first contact with other call areas on each of the bands 52 Mcs. and above.

SCORING TABLE

YKI VKO 6 6 6 8 VK1-2 2 1 6 VK3 2 6 VK4 1 2 3 8 6 VK5-8 6 2 1 8 5 VK6 . 6 4 3 VK7 .. 2 3 6 4 5 บารา 6 1 3 4 2

Note.-Read table from left to right for points for the various call areas. In addition, all intrastate contacts on bands 52 Mcs. and above are worth 1

point each. EXAMPLE OF RECEIVING LOG (VICTORIAN S.W.L.)

EXAMPLE OF TRANSMITTING LOG

Time G.M.T.	Band	and Power	Sign Worked	RST No. Sent	RST No. Revd.	W.h.f. Benus	Points Claim.	Time G.M.T.	Band	Em zio
								Aug. %5 14 0810 14 0812 14 1035 14 1040	7 Mc.	A3 A3
Note. St	andard	W.I.A. I	og Sheets	may be u	sed to fol	low abo	ve form,	Note	Handa	rd N

Date/ Time G.M.T.	Band	Emis- zion	Call Sign Heard	RST No. Sent	RST No. Revd.	Station Called	V.h.f. Bonus	Points Claim.
Aug. 45 14 0810 14 0812 14 1005 14 1040	7 Mc.	A3 (a) A3	VKSPS VKSRU VK€ZAZ VK3ALZ	58002 59007 56010 59025	Ξ	VKERU VKTŽI VKSŽDR VKSQV	 25 	\$ 5 38 1
Note.—5	Standa	rd W.L	A. Log Shee	ts may b	e used to	follow the	above	form.

11. All logs shall be set as in the example shown and in addition will carry a front sheet showing the following information -

Nama Address

Section . Call Sign

Claimed Score Declaration. I hereby certify that I have operated in accordance with the Rules and spirit of the Contest.

Signed. Dated. All contacts made during the Con-

test must be shown in the log sub-mitted (see Rule 4). If an invalid contact is made it must be shown but no score claimed. Entrants in the Open Sections must show C.w. and Phone contacts in

numerical sequence. 12. The Federal Contest manager has the right to disqualify any entrant who, during the Contest, has not ob-served the regulations or who has con-

served the regulations or who has con-sistently departed from the accepted code of operating ethics. The Federal Contest manager also has the right to disallow any illegible, incomplete or incorrectly set-out logs. The ruling of the Federal Con-test manager of the W.I.A. is final and no disputes will be discussed.

AWARDS

Certificates will be awarded to the top scoring stations in sections (a) to (c) of Rule 1 above in each call area. (c) of Mule 1 above in each call area. VK1 and VK8 will count as separate areas for awards. There will be no outright winner for Australia. Further Certificates may be awarded at the discretion of the Federal Contest

The Division to which the Trophy will be awarded shall be determined in the following way.

To the average of the top six logs shall be added a bonus arrived at by adding to this average the ratio of logs entered to the number of State Licensees (excluding Limited Licensees) multiplied by the total points from all entries in sections (a), (b) and

Average of the top six logs + Logs Entered
State Licencees
exclud, Z Calls

Total of Points
from all Entrants
Sect. (a) (b) (c)

VK1 scores will not be included with VK2 nor VK8 with VK5. Acceptable logs for all sections shall

show at least five valid contacts. The trophy shall be forwarded to the winning Division in its container and will be held by that Division for the specified period.

RECEIVING SECTION

This section is open to all Short Wave Listeners in Australia, but no active transmitting station may enter. 2. Contest times and loggings of stations on each band are as for transmitting.

All logs shall be set out as shown in the example. The scoring table to be used is the same as that used for transmitting entrants and points must be claimed on the basis of the State in which the receiving stations are located. A sample is given

to clarify the position. It is not sufficient to log a station calling CQ—the number he passes in

a contact must be logged. It is not permissible to log a station

in the same call area as the receiving station on the m.f. and h.f bands 1.8-30 Mcs., but on bands 52 Mcs. and above such stations may be logged, once only per band, for one point. See example given. VK1/VK2 and VK5/VK8 are considered to be the same area for scoring purposes. A station heard may be logged

once on phone and once on C.w. for each band. 5. Club receiving stations may enter for the Receiving Section of the Con-

test, but will not be eligible for the single operator award. However, if sufficient entries are received a special award may be given to the top re-ceiving station in Australia. All operators must sign the Declaration. AWARDS

Certificates will be awarded to the

highest scorers in each call area. Fur-ther Certificates may be awarded at the discretion of the Federal Contest

TRANSMITTING OPEN - VHF/UHF ONLY SECTION (SECTION E) Additional Notes

1. This section is being introduced this year in answer to the request by this year in answer to the request by many Amateurs that provision be made for participation by Limited Licensees and other VHF/UHF operators. It is in the nature of an experiment and because of this logs entered for section (e) will not be considered in the determination for the Trophy winner at experience, response to this section by those it is intended to interest, and comments from all interested parties, other additions and changes may be made.

2. All intrastate contacts in the bands above 52 Mes. will count for one point. Interstate contacts will be valued as in the table for MF/HF contacts including the bonus 25 points for the first contact with each new call area (v.h.f./u.h.f. only). 3. Entrants may submit logs for one

Transmitting Section other than (e) and interstate VHF/UHF contacts may be included in both logs

Logs must be set out in the stan-dard manner prescribed.

AWARDS

Certificates will be awarded to the highest scorer in each call area. Note L-The Federal Contest manager emphasises the need for strict ob-servance of Rule 9 in the Transmitting Section and Rule 3 in the Receiving

Note IL.-Note that the use of G.M.T. is required in accordance with Insti-tute Policy to encourage the use of G.M.T. by Australian Amateurs.

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ACCURACY 0.01% OF STATED FREQUENCY

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12.5 and 14 Mc. Fundamental Crystals, "Low Drift" Mounted only, £5.

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ROSS HULL MEMORIAL V.H.F. CONTEST 1964-65 RESULTS

The Federal Contest Committee takes pleasure in presenting herewith the results of the 1964-65 Ross Hull Memorial V.H.F. Contest.

We would like to thank those contestants who submitted suggestions and comments on the contest. All of these will be extracted and sent to Federal Executive for further consideration. The comments were many and various and a few selected at for the interest of contestants immany for the interest of contestants.

VK2—I do not favour the suggestion that a 7 or 9 day period of operating be selected instead of the present period. The consuler the number of stations partipating. Contest to be limited to 52 and

144 Mcs.

That the phone section be open to only "Z" calls.

The suggestion of a 9 day log is a good one.

VK3—I can see nothing wrong with the way the contest is run and hope that it is run the same way in

that it is run the same way in the future. The scoring table encouraged the use of the 432 Mcs. band, and surely this is the purpose of such a contest, to increase the use of the vh.hf. bands.

the v.h.f. bands.

I enjoyed the contest, but think that a month is too long and that logs should be limited to a 7 day period.

period.

The scoring table for the 432 Mcs. band is unrealistic, as it is very similar to the 144 Mcs. band propagationwise.

VK4—I'm very much in favour of the present duration of the contest being retained and would just as soon stick with the old method of scoring using the full four weeks.

I would be seen the way the current Scoring I am very happy with is the way the current Scoring Table is set up, by far the fair-

is the way the current Scoring
Table is set up, by far the fairest so far.

VK5—Points should be allotted for contacts on 6 and 2 metres other-

tacts on a and 2 meters of onewise the country stations have all the country stations have all the country stations have interest and activity is less. A certificate should be awarded for the best 7-day period log submitted in addition to the present awards. That the contest be shortened to

the choice of the contestant, to say a nine-day period within a "limit" time as laid down by Contest Committee, December-January.

VK6-The length of the contest should remain a month but a log for a nine-day period be required.

VK8—I think that the duration of the contest is ideal and would not like to see it shortened, and am quite happy with the rules as they are. It is not possible to list all of the comments in detail, but contestants should be able to realise that there is a considerable difference of opinion on the matters listed. One of the fixen was the inclusion of a sub-section in the Ross Hull Memoral V.H.F. Contest for an award to be given to the best limited to the contest of the con

This year's honours go to VK3ZER R. W. Wilkinson, with a score of 5,787 points, which under the circumstances was a very good effort.

In conclusion we would like to congratulate the other award winners and thank those who submitted logs and suggestions.

Federal Contest Committee, W.I.A.

TROPHY WINNER

VK3ZER-R. W. Wilkinson .. 8787 pts.

AWARD WINNERS

Section A-Iransmitting,	Ober
VK2ASZ-R, L. Lear	2240 pts.
VK3QV-D. H Rankin	
VK4PU-J. D. Purdon	1822 ,,
VK5CL-H. M. Blythe	
VK8LK-C. J. Kosina	
VK8KK-D. A. McArthur .	4312 ,,

Section B-Transmitting, 1	Phone
VK1VP-E. Penikis	1386 p
/K2ZFB-A. F. Birch	2220
/K3ZER-R. W. Wilkinson	5787
K4ZLG-C. M. Lloyd	3338
K5ZKR-C. M. Hutchesson .	4245
/K6ZCN-A. L. Martin	2434
/K7ZAH-K. J. Hendricks	1626
VK8ZMD-A. M. Dunn	180
ZL1AMN-D, A. Johnston .	
L2APC-H. Burton	340
L3AAU-J. G. Miller	950

INDIVIDUAL SCORES

Section A		
VK2ASZ-Blaxland		
2TR—Bega		
VK3QV-East Malvern		
VK4PU -Woombye	1822	27
VK5CL_South Plympton		27
VK6LK-Ardross	1634	21
6MM—Nedlands	552	20
VK8KK Alice Springs	4312	55

Section B							
K1VP—Canberra	hou	1386	pi				
K2ZFB-St. Mary's :							
		2106	,				
2ZCF—Croydon			,				
2ASI—Inverell		794					
2ZCT—Whitebridge	-						
2ZDT -Cambewarra		688					

VK2ZFS—Goonellabah		pts.			
2BAE—Armidale	352	11			
2ZRE—Cooma	260	33			
2ZWM Kahibah	226	D			
2GJ—Kyogle	218 154	30			
ZZAZ-Nowra		11			
VK3ZER-Ballarat East	5787	13			
3ZNS—Beaumaris	1410	24			
3AEE—Glenroy	1361	14			
3ABP—Altona 3NB—Camberwell	724 580	53			
3ZGP-Fawkner	396	45			
3ZOP-Moorabbin		21			
		10			
3ZOP—Moorabbin 3ZMS—Frankston 3ZRY—North Balwyn 3KU -Kilmore	276	12			

		12			
3ZBD-Ormond		19			
VK4ZLG-Wacol	3338	**			
4RO—Ayr 4ZWS—Bundaberg	1524	19			
4ZWS—Bundaberg	69B	**			
4ZWR—Bundaberg VK5ZKR—Yahl	32	11			
VK5ZKR—Yahl 5ZDX—Oaklands Park		1)			
5ZDX—Oaklands Park	2008	Pt			
5ZMJ—Port Pirie	1706	57			
5ZEJ—Gawier Rau	1592 1508	31			
5ZIK—Yorketown	1332	23			
5ZGF—Plympton	1250	23			
5ZTM—	1217	51			
5ZBR-Gawler East	1110	**			
5ZJH-Somerton Park	1069	10			
5EF—Gawler .	316	11			
5ZTS—Parkside	110				
5TN-King's Park	86	21			
VK6ZCN—Bunbury	2434				
6ZDS—South Perth .	2022	- 11			
VK7ZAH—Ulverstone	1626	17			
7ZAQ-Lenah Valley	934	11			
7ZTX—Newtown	588				
7ZAA—Burnie	526	23			
7ZAO-Lenah Valley	212	77			
7ZBK-Glenorchy	38	79			
VK8ZMD—Darwin	180	17			
ZL1AMN—Auckland		**			
ZL2APC—Eastbourne .	340				
ZL3AAU—Christchurch ZL3RK—Christchurch	950	20			
ZLSRK—Christchurch	510	91			
Section C					

Section C —R. C. Abernest

WIA-L2211-R. C. Aberneathy,		
Miranda	466 pts.	
WIA-L2188-C. R. Christian-		
sen, Booragul	22	
WIA-L3138-G. N. Earl. Black		
Rock	78	
WIA-L5049-D. De Cean.		
Brighton	1404	

CALL BOOK MAGAZINE

The Federal Treasurer, W.I.A., has several copies of the 1964 Call Book Magazine for sale at the bargain price of £1 each, post free.

There are two editions:—

There are two editions:—
(1) American Amateurs.
(2) Amateurs of the World expt Americans (known also as

DX Listings).

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VK7-No comments

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Amsteur Radio, July, 1965 Page 16

VK-ZL-OCEANIA DX CONTEST 1964 RESULTS

	AUSTRALIA	L5065 3470	Europe
C.W.—	26 40 26 35 Total	L5067 230 L6021 8445	DL7AA
VK2EO	- 4035 5515 - 9650	BERS195 4965	DLIJF 315 OHSPT 94 DMINBL 64 OHIPN 40 DMIBJD 48 OHIJM 20
2GW 2APK	- 3210 3525 2870 9405 - 2405 4250 1660 8315	NEW ZEALAND	DM2ATD . 40 " OH3XZ 8 "
2RA	1720 3695 1900 7315	C.W.—	G4CP 1344 . OH2AC . Check
2VN	- 1840 4735 570 7145 210 2235 1930 1510 5885	ZL1ABZ — 1940 5235 2150 8425	G2DC . 588 , DK2KGD . 48 pts.
2QL 2AAH	210 2235 1930 1510 5885 1875 1875	1ARY — — 5395 — 5395 1QW — — 110 240 350	GOXN 33F OK3CBR 38 " HALKSA 340 OK2QX 24 " HEREK 408 OK1ADM 12 "
VK3AXK	- 3165 2070 1040 6275	ZL2GX - 5760 - 5760	ITITAL . 650 , OK2DB 8 ,
3MR 3DQ	5745 - 5745 - 1575 1500 900 3975	ZL3IS — — 525 — 525 ZL4GA — 3860 2410 2885 8965	OEIRZ . 530 , OKIOO . 3 ,
3XB 3SR	3280 265 3545	4BO 2880 576 1485 4870	
3RJ	— 750 165 915	4JF — 1529 190 — 1710 ZL1HY — Check	OZIH 78 " PASWAC 104 "
3QV	— — 530 530 Check	Band Leaders—C.w.	OHSUX 688 . BMSCCE 1080
STL VK4LT	- 4515 2315 6830	40 Metres: ZL2GX 5768 points	ORISH 288 SMSDSF 2
4SD	- 3955 - 3955	ZL4GA 3680 "	OR5UQ 368 SM7QY 180 pts.
4WO VK5NO	1020 - 1020 110 5950 7435 2390 15885	ZL1ABZ 5235	OHTQC SOS , YUINCD 65 ,
5RX	— — 2445 2445	15 Metres: ZLAGA 2895 "	U.S.S.R.
VK7DK	- 1725 3415 - 5140	ZL4BO 1435	UCSAR S0 pts. UASKAB 2 pts.
VK9GC 9RB	1870 1740 3610 790 _ 790	All Bands: ZL4GA 8965 ZL1ABZ 8426	UP2UK 16 UASRR 8
	and Leaders—C.w.	ZL2GX 5760 "	UGSGA 56 " UA4PA 286 "
80 Metres:	VK2QL 210 points	PHONE— Call 40 to 15 Total	UBSCG W UWRCS 48
40 Metres:	VK5NO 110 " VK5NO 5950 "	ZL1HA — 6990 — 6990	UTSCC UAOKCA 8088
10 HIGH CO.	VK2EO . 4035	1ABZ 165 6420 — 6585 1AGO 1870 — 1870	UASUJ 478 " UAOTO 78 "
20 Metres:	VK5NO 7435	1HY Check	PHONE—
	VK3MR 5745 " VK2EO . 5515 "	ZL2GX — 2475 — 2475 ZL3AB — 2130 — 2130	DUIGF 477 pts. VRIB 1850 pts.
15 Metres:	VK2GW 2670	Bard Leaders-Phone	KHSEPW 2563 WAVIII 6396 KHSPRI 2020 VRAVE 90
	VK5NO 2396 " VK4LT 2315 "	40 Metres: ZL1AGO 1870 points	WASDVC/EGS 18 " EEIAH 81 "
All Bands:	VK5NO 15885 "	ZLIABZ 165 ,, 20 Metres: ZL1HA 8990 ,,	HK4AHT South America OA4GK 100 pts.
	VK2GW 9405 "	ZL1ABZ 6420	OA4KY 260
PHONE-		All Bands: ZL1HA 6990	North America HISWSR See pts. W3MSK 1955 pts. HP1JC 268 W4RLS 576
VK2APK	68 29 15 Total 1030 4575 898 6495	ZL1ABZ 6585 75 ZL2GX 2475 76	MEPHCINE 434 KSEVR 3254
2WD 2AKF	- 4465 - 4465 710 1355 340 2405	ZL LISTENERS' SECTION	RPAREN 236 KSOVF 181 PIRCR 180 WASWPO 80 WBENFY 70 WASIN 896
2MR	- 1580 1586	ZL149	W0LBB 136 ,
2CM VK3ATN	- 1540 - 1540 2200 6605 1875 10680	ZL190 6168 ZL292 370	Agia EPIBQ 830 pts. JASCPZ 2 pts. HLSTT 130 JASAGU 3
3XB	845 300 135 1280		PM 11.0 JASNP 1640
3QV 3TL	1170 1170 Check	OVERSEAS C.W.~	JAIMIN . 36 " UWSCC 432 "
VK4LT	— 5620 660 7365	North America	JARDNA _ RE ,, UHEBO
4DO VK5MS	- 915 - 915 - 9860 - 9860	H18WSR _ 278 pts. KSIEC _ 1458 pts. VERAU _ 18	Europe
5GG	— 2865 — 2865	WESMFX 858 WASWPG 140	
5FT	— 1520 — 1520	WAZKED 205 WESTUH 32 WZHL Check KSEVR 2 W	
VK7DK	— 2800 — 2800	W3VKD 736 pts. K7AL 1003 " W4HOS 45 "W7DJU 100 " W5WZQ 1800 "W8JIN 8730 "	DLEDX - 238 , OH2YV - 14 ,, DLSEN , Check OHISH - 2 ,,
	nd Leaders—Phone VK3ATN 2200 points		GENON 670 OKIADP 32
40 Metres:	VK2APK 1030	WASEPQ . 4887 _	
20 Metres:	VK3XB 845 "	South America HK3RQ . 1205 pts. PYESO 72 pts.	DELEZ 782 SM3AGD 1080 H
25 Melles	VK3ATN 6605 ,,	HKJAVR - 800 " FYECQ - 72 "	OZAWR 102 SM5LL 528
15 Metres:		Asia	UAICK 250 , SMSIC 80 ,
	VK3QV 1170 "	JASEUV 6334 pts. JASAKL 1130 pts. JASEU/1 112 JATAD 3003	OVERSEAS LISTENERS SECTION
All Bands	: VK3ATN 10680	JAIMÚN 125 JATCEM 88 JAICUJ 1 JAICUJ 4 JARDY 239	OK1-7458 . 484 pts. VE3-7654 234 pts.
	VK5MS 9869 " VK4LT 7365 "	JAMURU 967 JASAMR 113 JAMARI 14 JASAKR 1	OR3-9280 400 " W0-10646 180 " SM1-3589 395 " WPE 6DX6 180 "
VK I	LISTENERS' SECTION	JAMACR . 10 , JAMSU 144 ,	NM4-3825 120 JA1-3477 1222 HESFIMO 348 JA1-4451 20 DL 5497 297 JA2-1855 306
L203	3 375	Oceania	DEA-35855 318 JAR-2335 . 184
L3130 L4010	8 2605 8 1545	DUIGF 588 pts. VR1B 4680 pts. KH8AHZ _ 56 _ ZKIAR 1140 _	DEA-13864 100 JA5-1231 108 UA3-18765 384 UA3-18765 384 HIRPSH 70 UA3-18765 70 UA3-1

W.I.A. YOUTH RADIO SCHEME

ANNUAL REPORT TO FEDERAL CONVENTION - EASTER, 1965

coult Reado Schemes during the 1884-68 parted, or the eastern flates this has been a peried or the eastern flates this has been a peried of real progress and major effort by all con-error with the implementation of this aspect in the second flates and the second flates are the flates and the second flates are the second flates but this elastic in some flates but this elastic in some flates but this elastic in some flates are the second in voluntary and important in voluntary of must accept the unfavourable aspects the units of the second flates are the second flates and the second flates are the second flates are the second flates and the second flates are the second flates are the second flates and the second flates are the second flates

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Contact regulations have been conducted in a contact of the plant of distributed for the plant of the plant of

valued 15 Profesionery Renge vegetiers and as well-defined to the period of the period

The Australian Air League is another Aurelian youth organization which is interested in our works and several discussions he for future occupration. I have a special is event in this organization, of which I we not of the serious members and for which here in this organization, of which I we present the serious properties and of the conperties for about 20 years. I was please to your Eddio Scheme to the opening to the Air League's new offices at Priesphare. gree of co-operation and procupation of each sheer's swards. Most of these expotations are reprorecibing faulty and next year's report should indicate the nature and crient of the should indicate the nature and crient of the course. There are other youth movements which still have to be contacted and time is the entry factor which has prevented thit that there is a real need for the type of activity which the Youth Kadlo Scheme offers to roung Australians.

A treatment former of the year operation of the control of the con

In New Seath White the Superior of the second process of the second process. The Superior Section of t

tions. Unfortunedely, T. H.B. resources and which gives from claim to the description. I which give the description of the control of the con

Vicinita, the first priferar nebuch bogs and vicinita for the property of the

the control of the co

Newsletters.

Youth Radio Scheme activities are well licised in both "Amsteur Radio" and "Ru Television and Hobbies" by Mr Ken M. VENEMEN and Mr. Discour. March. 1987.

Page 18

of these magnitudes for their continued expect during the year Desguite their effects, one feets that there are mixed another with a contract of their contr

seems to be beyond the realms of probability in the N.S.W. Division a large range of inter-club competitions has been presented for inter-club competitions has been presented for compensate has been presented and the hope of the compensate of the

possible
This session has seen the introduction of the
Radio Instructors' Certificates, which were
precified in the original draft of the scheme,
precified in the original draft of the scheme,
various reasons. These certificates are now
various reasons. The certificates are now
various reasons. The certificates are now
various reasons. The certificates are now
various and various certificates and effort
over a considerable period. Congressibilitions
are due to Mr. Keith Howard (VKEACK): On
are due to Mr. Keith Howard (VKEACK): On

Westlaker Radio Chè and to Mr. Em Mattle VIRIEM of Lyrelson High School on being VIRIEM of Lyrelson High School on being illustration and the second second second interface, were found that still changes at he of of each year cause larves in the cital stantons in each State. Accordingly, it has tentated to the control of the stanton Child Registration Certificates are available for Child Registration Certificat

this method: the Youth Badie Schomes street that before the best in since the since the since the middle with the best of the since the since the middle with the best of the since the since and the since are since since ar

With increasing numbers of loys and gifts protectionizing in ZLB, it suggests that the state of the control of

at an appropriate price.

The proposition of rederal Confidence is one which should be shared by secretarily it can be sufficiently as the secretarily secretarily as the secretarily as

their share of the burden in rotation.

I should like to excees very slacer thanks operation, by suggestion, by suggestion, by suggestion, by suggestion, by suggestion, by suggestion, by suggestion of opinions, by willingsees to try new ideas and suggestion, by suggestion and suggestion of opinions, by willingsees to try suggestion to the suggestion of the suggestion of

nembership.
R. G. Black (VESYA),
Federal Co-ordinator, Youth Radio Schan

NEW CALL SIGNS

VEOLOGY, B. D. Delly, IS Jamonez Street, S. VEOLOGY, S

VEZEZI-Ö-B. D. Sternier, 180 Carona Avenue,
VEZEZI-Ö-B. S. Carely, P. Ø Abbeiderd Rosd,
VEZEZI-Ö-B. S. Carely, P. Ø Abbeiderd Rosd,
VEZEZI-Ö-B. S. Roste, 190 Forcet Rosd, Poels,
VEZEZI-Ö-B. N. Rortis, 18 Korosteb Sizeet,
WEZZI-Ö-B. D. Duncer, 18 Albies Sizeet,
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WEZI-Ö-B. D. G. Stenniere, 180 Wanges Rosd,
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VEALED—N. B. Walker, Jordon Road, Point VEALED—R. B. Tucker, 64 Pancemic Road, VEALED—R. B. Stary Street, West Discussion Works, 19 Hard Street, Support NAMED—R. Street, West Discussion WARD—R. Street, Walker, 17 Hands Street, Support NAMED—R. J. James, 13 Vealeria Road, Seather WALED—R. J. Schrinker, 18 Repost Right, VALED—R. J. Schrinker, 18 Repost Right, VALED—R. J. Schrinker, 18 Repost Right, VALED—R. J. Schrinker, 18 Repost Street, Name and Research Res

VKEYE-I. R. Prior, 47 Tannock Street, North Balwyn. VK4BW-Bundsberk Amateur Radio Club, Station: Avoca Street, West Bundsberg; Postal: Post Office Box 188,

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VELUT—A. R. Harrison, 58 The Brire, Concentral Confession, 58 The Brire, Controlled Confession, 58 The Brire, Belle-VELUX—G. A. Trypett, "Karlon," Kinember VELUX—G. P. Joses, 26 Certer Street, VELUX—G. P. Joses, 26 Certer Street, VELUX—G. R. Mikhelli, 13 Serzbevouth Street, Kogarch, 10 Zeinbergh, Bond, Street, Kogarch, 10 Zeinbergh, Bond, Confession, 10 Zeinbergh, Bond, VELUX—G. P. Serbis, 27 Montals Street, Born VELUX—B. D. D. Serbis, 28 Montals Street, Born

APRIL, 1965

VICANGE,—R. K. finryth. 300 Mereinad Bond, VICANS Birthards, Schools, 501 Riversidad Bond, State of St

"Station: Hardway Storet, North Storet, Nort

Phone 34-6539, write or call
WILLIAM WILLIS & Co. Pty. Ltd.
428 Elizabeth St., Melbourne

for GELOSO

Equipment and Components

Amateur Radio, July, 1965

SWL

Sub-Editor, Ches. Aberneathy, WIA-L3311, 30 Urunga Parade, Miranda, N.S.W.

This month you will no doubt notice that our section has been reduced somewhat in size. The problem of space brought this about, so it have been the choice that appeared in the past, with this in mind I shall rotate items, such as the DX ladder, which will only appear our times a year.

Congratulations to each member of the various States who gained awards in the 1966 R.D. contest.

continue to the station on sain by the incession probe of the station of the station of the station brould first be tuned in on normal a.m. position. Then write in the bi-Os, and adjust it until the station of the st

NEW SOUTH WALES

NEW SOUTH WALES
With the increased attendance at our May
general meeting we feel that the lapse of
which our committee complained was just a
period that most groups experience from time
to time. We can, with continued support, so
ahead and organise to retain the interest of
those who attend. Arnold 1.2591. I trust by now that you have the information about the converter, if not let me know, and I shall place a request in the Bulletin. Robert Likes. Very good on all your pro-jects O.M. A decent antenna should put your really in business.

Msc L2074. Your weekly comments are much appreciated. Letest card to hand UPICT.

Don 1,022. I am very pleased to hand your decision and many thanks for your let-ter at long last. Hope to meet you in the near future.

PICTORIA

VICTORIA TO A TABLE OF THE STATE OF THE STAT Grag L3138. Thanks for those QTH's, they will be very handy, and keep me going for some time. QSL's received, VKD, SM2, KXS, VKS, HCL

Warwick L3211. That radio/study timetable seems quite a good idea. Pleased to haar aat you had some good DX, and received gds from VS9, EP2, VKS and LUX.

Eric LSO42 has sent 340 reports for the first five months of the year to 30 countries, with in-wards QSLY from CO2, PKS, HMS, HL, UL, VAA, ULBS, 64E, ULP2, KSLVO, 4UL, 4X4, 5A5 and 5Z4, Heard, 13 Mac, VKSWI, VKSLYO, 7 Mac, F3, ULF, USS, SHI, SRS, UOS, 14 Men, OLF, UQ2, DLA, UA2, DUJ, USS, KLT and JAT/AME.

At the moment 3.5 Mcs. is very good for local and interstate, with quite a marked increase in s.b. ops. on that frequency. On 21 Mcs. the JA's are plentiful with good spannedic openings to the States. Aften 12136/

Afton Lillary VK4. Thanks for the informa-tion on the vertical, I will use it when time permits. I trust that your trip will be a pleas-sant and profitable one. Hope to catch up with you on \$2 Mcs. later this year.

SOUTH AUSTRALIA

BOUTH AUSTRALIA

Alon LSoSS. I trust that you managed a replacement for the tube in question. O.K. re those cards, very good indeed, and thanks for the offer. Latest QSL's to hand, ODA, TI2, YKS, VKS, WA3, and heard 7Q7, Ws, JA's and ZL's. WESTERN AUSTRALIA

WESTERN AUSTRALIA

Rivan LEGIS, Soury or the solve up with

Rivan LEGIS, Soury or the solve up with

gest that you place as ad, in "A.R." or that

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LAS and TPL

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HAT and TPL

Allin LEGIS Resed on So metres. CTL

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Tourists. Soury in hear of IX condition

month, BCL XXI, ZDR, KSS, 7QT, WA4, CRS,

22 and VQL.

TABIFANIA

Very sood openings on the 15 metre band between 1000 and 1780 east, with Wr strongert but quite lively during daylight bours. 1880, Greg Johnson. Many thanks for the circuit of the convertor, which will be cepied and of the convertor, which will be cepied and P.CR. GJ. H.B. HPI. JA's, KFR, UAI, UMS. V.C., VES, W.S. XZI, ZZB, 884, CZS, VVS, 62.

TENNERAL
TYALAND is to be CHARZ shortly, no details
TYALAND is to be IND. Condition. Eye 1 2002. If it is to be IND. Condition. Eye 1 2002. If it is to be IND. CondiCondition. Eye 1 2002. If it is to be IND.
SW 1. S.
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S.W.L. DX LADDER

Countries Zones W

E. Trebilcock	205	202	40	50
P. Drew	365	258	36	36
A. Westcott	102	159	34	11
M. Hilliard	92	261	33	14
M. Cox	39	235	23	33 34 35
G. Earl	वर	165	35	34
L. James	33	181	35	35
R. Kearney W. Smith N. Harrison	80	168	33	_
W. Smith	18	183	38	- 7
N. Harrison .	62	281	33	35
A. Raftery	33	154	31	
R. Rarrison	20	70	17	
B. Prosser	17	136		- 2
 Mackintosh 	- 15	58	15	3
T. Corbin .	12	34		-

Wireless Institute of Australia

Victorian Division A.O.C.P. CLASS

commences

MONDAY, 2nd AUG., 1965

Theory is held on Monday evenings, and Morse and Regulations on Thursday evenings from 8 to 10 p.m.

Persons desirous of being en-rolled should communicate with-Secretary W.L.A., Victorian Div-ision, P.O. Box 36, East Melbourne (Phone: 41-3535, 10 a.m. to 3 p.m.), or the Class Manager on either of the above evenings.

Correspondence

any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

INVENTOR OF SUPERHET

INVENTOR OF SUPRREXT
Editor, "AR." Dear Sir.—How much longer
is "AR." going to keep stating that Armstrong
was the inventor of the superheterodyne? Twice
recently this insecurate statement has been seen
in the pages of "AR." Can we get it correct? The facts are: The patent of Armstrong
is 8 months behind that of Schottly of Ger-Schotiky was 12 months behind Lavy of Schottky was as mouths Schottky was a mouth France.

In the 1980's a law suit involving Armstrong and Levy and the superheterodyne was decided in favour of Levy by the U B. Court.

If you could print this letter it may help to clear up the wrong impression created.

THAT WORD "WE"

-Norman Burton

Editor, "A.R.," Dear Sir,—I have noticed re-cently that many chaps when on the air use the personal pronoun "we" when they mean The fraternity is reminded, therefore, that the ho. (a) Are Siamese twins; (b) are pregnant; (c) ave tapeworm.
Unhappily, this is not original:

["We" are not amused.—The Editor.]

Editor, "A.R.," Dear Sir,—America's 250,000 Amsteur radio; "Hang" were honoured on Darber The stamp was issued on the 50th anniversary of the American Redio Relay League, an organization almost as old as radio itself. The operator, however, is older than the League and there is an interesting story behind this send there is an interesting story behind this word.

One of the first handler redid, by word, and the send of the send handler redid, by the first property of the first latter of the surnames of the three of the surnames of the three Amsteurs who may be the surnames of the three Amsteurs who may be the surnames of the three Amsteurs who may be the surnames of the three Amsteurs who may be the surnames of the three Amsteurs and the surnames, Boh Almy and Peggie Murray, best 17 when the surnames and the surnames of the su

-"Stamp News." April 1, 1965, Page 23.

Publications Committee Reports That . . .

Inward correspondence from VK's: 4WP 488, 5EK, 3AVU, 2ZTM, D. Priestley, N. Bur ton, J. C. Haseldine and Rev. Bro. P. L. Ellis has been published in this issue or ack nowledged. Technical articles ware restored ton. J. Mandelsen and New Bre. P. L. Mandelsen and New Bre. P. L. Mandelsen and New Bre. P. L. Mandelsen and Mande

"AR" all Amateurs are requested to promptly notify the P.M.G. and "A.R." of the change of address, as the next edition of the Call Book will shortly be in preparation, hence it your current address in the Call Book is in-correct then this amendment should be noti-fied as soon as possible.

_ 1296 Mc _ 144 _ 420 _ 576

Sub-Editor: LEN POYNTER, VK3ZGP, 14 Esther Court, Fawkner, N.15, Victoria ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB-EDITOR

Out of the mid-winter gloom arrived an interesting note from KSMGQ WEDMG, who
made CHRUY. Wa 3M monohomounce, is fooking
made CHRUY. Wa 3M monohomounce, is fooking
Mos. He is available every day of the year
between 000-1232 G.M.T. Am interested
when may more than the CKMGQ or
WEDMG on the control of the control
window of the control of the control
window with WEDMG in this venture. a worthwhile contribution to Amateur

by joining with wolfNG in this venture. Following the lead of VKS, VKS, it is reported in the VKZ V.N.F. Newslatter that ZL investigating the possibility of settling up become on 2.M. It is also reported NZART has requested techniciant be allowed to tree 6 M., but was retried because N.Z. has signed agreements with the LTU—mores required required because N.Z. has signed. agreements below 2 M.

selow 2 M. Wonder how many Amateurs followed the Vonder how many Amateurs followed the progress of the recent U.S. space journey awen't heard a whitsper as to what fre-quencies see in use—close secret perhaps. It is a pity that we cannot use 'he signals scelent training for Ocear. Anyone know what frequencies are in use?

Hope all correspondents will remember the new requirements when forwarding their notes from now on. Refer to P 6, "A.R." June for further details. VK3ZGP

NEW SOUTH WALES

NEW SOUTH WALES

The forthcoming events in VKE for July
The forthcoming events in the first Prices
July meeting which is on the first Prices
July meeting which is on the first Prices
Section of the combined transmitting entering
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to the com The group committee suggests that other fitted may hold their own event. From next year a v h f, section should be included with the general contest.

Little is known about the activity round the set of the control of the set of the control of the set of the control of the con

The subject of calling frequencies for 8 and 2 metres has been raised and at the last committee meeting it was decided that such a move should be done on a nation-wide scale rather than by Stabes. The request has been passed on to the Federal Councilor ZAPQ. pussed on to the Federal Councillor 2APG Early this year ZIAAAU paid a visit to VK. He has since sant a request for some infor-mation re the setting up and operation of the property of the setting up and operation of thould write to John as I expect that the would have to supply some good reasons to the Post Office. His address is John Miller ZJAAAU, 80 Fapards ZI. Christothurch, New

If it odd the number of three and place that you can met other Analestes. Direct that you can met other Analestes. Direct is recent trip to VKK. Brian EAND stopped for a minutes at the post office in Generals. The properties of the properties of

Operators on 146 Mex. taxif phones in this State have suffered some interference from the sound channel of Channel 10. This has been evercome by using a different crystal in the receiver An article on this appeared in the June V.H.F. Newsletter of which some spare copies remain 14 Atchason St. Crow's Next).

Some setivity is starting up on Channel A Some signals from Channel 6 Wagga have been received in Sydney during May. The DX season should prove interesting. 9734

SOUTH AUSTRALIA

SOUTH AUSERALIA
Activity in VKS al, the present time has resumed the usual Christmas level, regardless of
winder clements, which lend to keep Amsteurs firmly entrenched in front of the "moduledd link bottle" and radiators at this time of the yest

Current interest on 8 M at the moment is centred on a mobile and on 83.04. At the present that approximately 15 stations are present that approximately 15 stations are comment has been emphatically voked by those normality operating in this region, however, due to the availability of large numbers ment of a fact frequency was deemed most one state throughout the property of the instant comment regularity frequency. Due to the instant comment regularity for the comment of the frequency. the year necessary regardless of the frequency. Due to the insistent comment regarding the choice of this frequency, as alternative net is being considered on \$2.2. Whatever the complication of \$2.2. Whatever the complication of the complex of the complex

the case previously the case previously. Two Machine has also increased in intermediate in the control of the control of the case of t

crambles.

On 432 Mcs. Amsieur T.V. appears to be he only occupant. Of particular interest is he "Colour Television" transmissions being onducted by VXSZEV. The system being seed is the 3-colour revolving disc synthonously rotated at transmitting and received properties. Excellent results have been

achieved so far with minor complications and future experiments may provide many points of interest. 73's VKAZMA

WESTERN ASSESSMENT

WESTERN ALSTRALIA
The fee heat on Elect. May was good fun.
The fee heat on Elect. May was good fun.
States of the fee of

Supper was served by Mrs. Pemberton. Some cream puffs met a sad fate when they were dropped on the carpet. However, the carpet is now O.K. Brien told some interesting tales of life in the Air Force and I want

Graham SZDB had his GT Cortins out on the fax hunt and said it took the corrugations very nicely at 50, or was it 70? New calls heard are Glen 62FH, Igor 62FG, and Cyril 62BG. S.ab. cannot be used on agor as he persists in calling it d.ab., but it is no difference really, as he has only got a transistor practiver which was not made for

transistor receiver vinvasion by a b.f.o. tovation by a b.f.s.

Wally \$25.4 has returned from two weeks to the east iStates, not oriental) and is making up another 2 metre converter with a making up souther 2 metre converter with a state of 4 x 350 By a second of 2 metre of 4 x 350 By a second of 2 metre of 4 x 350 By a sedeband of 2 met. I understand has is going to use da.b. with indextand has is going to use da.b. with indextand has in going to use da.b. with indextand has in going to use da.b. with indextand has in some properties of a metre of the second of the sec



Manufacturers of Quartz Crystals for Frequency Control and Crystal Filters for highly selective circuits in the largest and most modern crystal plant in the southern hemisphere announce a new range of:-

CLOSE TOLERANCE GOLD PLATED CRYSTALS FOR AMATEUR APPLICATIONS

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Amateur Radio, July, 1965

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LM ERICSSON PTY.

Page 22

SIDEBAND

By Phil Williams VK5NN

Before my departure for Melbourne at Easter time for the Federal Convention it was suggested that VEB thould do something about suggested that VEB thould do something about left arm in pain following the twisting, your new scribe "wounterend" to try the other hand at writing the column until such time on the material drice up.

on the material dries up. Here in Australia the use of commercial equipment is goining ground quite rapidly, but there are still many VK Armsteurs who wish to build their own, and it is to help these chaps that this column will be written. If it can be carried on for a few years along these lines then the objectives will have been

exhibited mileton process of the should be religious for dail and seven of all acts, crashing with angle edited of exhibited acts of the should be religious for the should be religious for the should be religious for the should reach not should reach not be religious. As a should reach not be religious for the should reach not be religious. As a should reach not be should reach not should reach not be should reach the should re

131 Improvements to phasing type exciters, and towards this end, these notes will considered the state of the 12) The design and operation of linear su-plifiers for the DX hounds who want to get out and work hundreds of countries—so that they may still remain popular with their nearest Amateur neighbours. (3) Tips on transceivers and using them tobile and there must be hundreds of ideas this field worth passing on to others. in this field worth passing on to others.

(4) The use of s.b. on v.h.f.—with the advent of long distance record chasing, mombrounce, and the Oscar satellites, there is an upsurgs in interest in v.h.f., s.b. The VKS v.h.f. group is conducting a series of technical meetings dealing with 3-metre sideband, and I hope to be able to report some of their

doings shortly

(3) Reviews of commercial equipment—not
with a view to extoling its virtues, but to let
with a view to extoling its virtues, but to let
when the proposed to the Perings; a lowel
may right here and now that I do not sell
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A SIMPLE AUDIO FILTER FOR A PHASING EXCITER

To encounter the state through 1 might produce the state of the state

Fig. 1 shows the circuit of the filter and the recommended position for its beartion in registance divides network supplying the 72 voltage ratio signals to the seedle phasing net-rocis shown the Praiso 1804/190 chains, utilized norce shown the raiso 1804/190 chains, utilized one per cent bolescore resistors gives the cor-ticonstruct between them for disjutament, and climinates one more thing which can be mal-adquated to give poor signals.



The load on the transformer through the filter is 11850 plus 470 ohms; 2130 ohms, which when stepped up by the 31 transformer presents a load of 18,000 ohms to the half-12AUT triede amplifier, and this is quite good for the output level required from 11. The condensers used in the filter are values which may be built up quite easily from small paper, nice or small plastic film capacitors. Mine were 200 volt rating paper con-

densers of small dimensions. denters of small dimensions. The satisfies way for the home constructor to make filter inductances of the values required is to obtain suitable ferritis pot-corns or experies to the satisfies of the satisfies o of the Barns, Spire the turns required.

As an example I purchased some Philips cup-cores type XCL301.87 which require 33 T. per msl. To find the turns, simply take the multiply this by 32, which give 409 turns of Li. Likewise for Li which is 130 msl., the square root of 130 is about 11, and 11 x 32 gives 350 turns.

33 gives 330 turns; Winding the coils by hand, using 36 gauge hard enamelled wire on the end of a sprew-driver handle just larger than the core of the cups for on the correct formers which sometimes come with the correct, then adding a little thin tage and P.V.C. tubing to the lasts, took about five minutes each. Checking the filter with an audio oscillator showed the amplifier response to be level to about 2.7 Kes., with a quite dramatic drop in excess of 30 db. at 3.2 Kes. Similor fillers have been built using home-nsade windings on Rols filter choke cores, but it is only fair to point out that these are not quite as high-Q as the ferrile cored colls. Next month's s.s.b. column will deal with the frequencies below 300 cycles, and a few other tricks in the audio section of the occitor. 72. Phil SAN

DX-PEDITION OF THE MONTH

Increasing popularity of the "DX-Pedition the Month" programme as ania. of the Month' programme, as evidenced by the increase in number of QSL cards received during the past six months, now necessitates a change in procedure for submitting QSL's for confirmation.

Beginning April 13, 1903, QSL cards received from all W/K stations should be accompanied by a S.A.S.K. (self addressed, stamped envelope). All other stations (outside the U.S.A.) should send a properly self-addressed envelope. (Stamps or LR.C.'s not required.)

spec - change or LLC's not required.)

Since "DX-Podition of the Month" is now handling the QSL-ling for over 28 different stations, and we anticipate the continued addition of new ones, this new procedure will help to confirm QSC's more quickly and actor reduce the delay in getting your QSL's into the mail.

Our policy concerning cards received via QSL bureaus shall remain the same. All such cards are confirmed by way of the appro-priate bureau. -Stuart Meyer, WaGHK, P.O. Box 1982, P.O. New York, N.Y. 100001.

YOUTH RADIO CLUBS

This column has Correspondent's Syndrome this month-caretty of lefters bringing news. There is an open invitation for not only Sister Supervisors but also Chul Leeders and others to send me Henns from snywhere. The space to seen the lefter space to the greatest volume of news, wherever it comes from. VK2 usually leads but others are welcome to match them.

seeds but others are welcome to match them:

"You" Quadro the Month" are worthy of

"You" Change of the Month are worthy of

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your methods.

It is highly desirable to have a uniform.

It is not a second of the late of t

Would anybody at all in other Divisions please take great interest in the promise of Teacher's College Radio Club? The prime arrest should be the senior Science Teacher at every should be the senior Science Teacher at every Teacher's College Mais Bernice Langmend, Secretary of the S.T.C Club, has received the Station Call-Sign VKEZTC

Commission The Property of the Section of the Commission Theorem Section From the Commission From the Comm

State Supervisors are asked to investigate whether a YRS Lapel Badgs would be popular—perhaps a smillar one to the WIA Badge but a different colour Please advise Rex 27A with a rough numerical estimate.

Roger Davis (1RD) formerly of Lyncham High and now at University, has been authorised to give supervised "on the air" experience to candidates for R.T. and W.T. awards, and to sign the test requirements. An R.T. Certificate (Grade 3) has been earned by Andrew Davis, his brother, still 15. There is no favoritism here-Andrew is a very experienced operator, Ken 1KM



FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL

MEETINGS OF F.E.

30th Marck. This was a special meeting to finalise Convention arrangements and the busi-ness was restricted to sorting spends papers and datalled preparations for the Convention dinner. The Treasurer notified FE that he wished to retire this year but would carry on until a new one was appointed.

which the refer this year but would not to refer the time of t ntation of a pen to the retiring of Treasurer, the new Secretary

F.E. APPOINTMENTS FOR 1965-66 It is a service of the control opposite con

JAMBOREE CARDS FROM VESWIA Amateurs awaiting cards for contacts with VKIWIA at Rowville during the recent Jemboree will be pleased to hear that cards have now been printed and have in most cases. been forwarded through the QSL Bureau to those who made QSO's. All cards should have been sent during the past month.

---- SILENT KEY -----

It is with deep regret that we record the passing of: VK2LE-F. H. S Lee. VK2VC-W. B. V. Cabill. VK3ZDJ D J. Ashcroft.

The minutes of the Easter Convention heem completed in draft and checked. Bettils issue has been circulated, the minute should be in the hands of the typist and sued to Divisions before the end of

B.D. CONTEST BULES

Rome slight, changes will be noted in the Rome slight changes will be noted in the position of the position of the control of a former convention, as the small licensees. Although the entries from Z calls for this year's contest will have no bearing for this year's contest will have no bearing of the interest in such a section, and in how I might be best to include them in future in might be best to include them in future.

FEDERAL OSL BUREAU

QSL's for 'OH9 Amsieurs may now be sent b Box 1, Marishamn, Finland. Results of the 5th All Asian DX Contest are now to hund. The following excepts may interest VK hums: Continental Winners (Multi-Interest VK hums: Continental Winners (Multi-Interest VK hums: Continental Winners (Multi-Interest VK hums: DX:IAA 10.0050N 3.507, WA653DO 3.504, EUGAAY. 15.03
Continental Leaders (Single Band): 3.5 Mc.-Continental Leaders

VEGANA (1898, VIGAY II IN: VACINE 4681, EMBGC, SECOLAR of WEINDA who made REMGC, SECOLAR OF SECOLAR OF SECOLAR OF SECOLAR OF SECOLAR OF SECOLAR OF SECONA OF Vec 60/80. via Jack, WSCTN. Amityvilla, N.Y.,

U.S.A. U.S.A. Operators: Marttn OHIBH, Art OHIBM Mark OHIBS, Rick OHIBS. —Ray Jones, XXXII., Manager. ORIBH, Art OHERQ.

NEW SOUTH WALES

The Concell is now up to full strength or the concept that the strength of the concept that The Council is now up to full strength Divisional President, Ivan VKIARM, during a recent holiday to VK4 mei with Laurie ReZGL and the VKE President, who and with Laurie ReZGL and the VKE President, who and way home Ivan attended the annual meeting of the Far Northern club at Liamore. On he invitation of the President, Fred VKEFF, van spoke to the meeting on divisional acti-I yan spone we have believe the h.f. bands are dead must surely wonder about the 4800 cards handled by the burses for May The only way to keep the numbers up is to work on all possible bands and to keep the bands is to send your two dollars to the 1.T.U. fund. VEZ Division is dragging the chief this time

-cooler pages 2D, June "Agil-"Chair and your fewer of the pages and the page of the page o

"The Just and State of the Person of the Court State of the Court Stat there in fact. Some of the more mobils-minded premibers Some of the more without the second some second continues to the second some second continues to the case of the second some secon

I will be able to save up enough to be able to pay the deposit on one of these versatil-rigs. Jim 2ART also is in the care and he a well-equipped mobile station with which can speak to the world white on the

"well-couplesed module station with white of the commerciation of the co

usericies on 40. One of our members, David 2BSC, recently sectived a tape from some of the broadcast-yoel in 2L outlining the signals sent up the ine to warn that a programme was about to commence. If you want a good taugh at the agenuity of the engineers to write electronic arodies on oppular songs, you should bear arodies on oppular songs, you should bear

ingentity of the angineers of write electronic to the control of the angineers of write electronic on the control of the contr

n. each Monday night. 1 2001 to come so I'll see you then.

CENTRAL COAST AMATEUR RADIO CLUB The regular monthly meeting of the Countries of the Count

Geoff Mann, VKEXA, gave a short report on his trip to the Canberra Convention. He found it very interesting and enjoyable but stressed the importance of having confirmed accommodation.

accommodation.
Club members are very interested in Civil Defence and the most recent member to effect the control of the control of the control of the control protocol of the control protocol of the control of the training for other emergencies besides national Confort to Incaste on the Bristhane Water and recently two teenage Civil Defence crew, which included some of our members, located them on Lion Island at the most of the Hawkenburg River.

OBITUARY PRANK LEE, VESLE

Lee, VKILE, of Avoca died on May 20 at the has Arnaleur license in 1828 and his com-mercial operator's license in 1825. He spent 20 years in New Guilees as a wire-less operator and engineer and was on the beginning of the Japanese invasion. In fact, he intercepted the message which selvised this was to happen and patches. He is survived by a son and daughter and we wish to extend our concloiences to them.

WILLIAM BENJAMIN VINCENT CABILL (VKEVC)

CABILL (VELVC).

The N.S.W. Division in particular, and be Amsteur Radio movement generally, ave lost another keen supporter in the eath of Vinec Cabill (VERVC), who, we gret to report, passed away suddenly

death of Vince Cabill (VEGVC), who, we regret to report, passed away suddenly regret to report, passed away suddenly allowed to the control of the control o

station.

At about the same period he was a Councilior under the chairmanship of the late Jim Corbin, VKSYC, and also filled the position of Secretary-Tressurer. iste Jim Corolo, Vast, and gain in the position of Secretary-Treasurer The Divisional Council was represent at the funeral at Woronora Cenetary Friday, May 28, by one of the Councillo Mr Chas, Wilkins, VK2ALB, and the

tendance. Vince is survived by his mother and four brothers, and all members of the Division join with their many friends no effering them our condelences in their tragic lose. VKCAIM.

Paul Goldsborough, of Goeferd, now has his licence and his call sign is VKEAVK. He passed his examinations several months are but has only recently turned 16. It is good to see boys like Paul coming into the club and we are looking forward to more.

and we are footing forward to more.

At our last meeting we had a visit from David Season. The Control Transport Arizona.

David Season. The Control Transport Arizona. The Control Transp

Frank Pearson, VK2ACQ, now of Umina, has been elected to the W.L.a. Council and we wish to congratulate Frank on this honour The club meets on the third Friday of sach month at the School of Aris, Mann Street. Gosford. Visitions are welcome and we would be interested to hear from any fateristic people who may be keeding north for a winter holiday. 72, VKZAXS.

BAND ALLOCATIONS C.w. Only C.w. and Phone

Ke.		Kc.
	3,500 - 3,535	3,535 - 3,700
	7,000 - 7,030	7,030 - 7,150
	14,000 - 14,100	14,100 - 14,350
	21,000 - 21,150	21,150 - 21,450
	28,000 - 28,200	28,200 - 29,700

VICTORIA

VK3 Council met on 24th May The first matter attended to was the annual "dobbing" session. The result gave the following:

President K. E. Pincott, VK3AFJ

President K. E. Pincoti, VKAAF; Vice-President J. B. Battrick, VKAOR, Vice-President and Ped. Councillor M. J. Tressurer K. Rogel, VKAYA, Librarian B. Henderson, VKAYA, Librarian B. Henderson, VKAYA, VKAP, P. S. E. Pincoti, VKASA, S. L. Inwards: E. Treblicock, L3942, GSL Dutwards: I Setford, VKAXB

GSL. Outwards: I Selford, VKSXG.

Icss Instructors J. R. Lancaster, VKSZI.,

Correspondence: K. N. Pickering, VKSATP.

Correspondence: K. N. Pickering, VKSATP.

Course Inst. D. Pinson

Transmitting Officer: P. E. Linden, VKSBX.

Disposata

Company Company

J. W. Reilsberg, VKSAIJ.

Z. W. Reilsberg, VKSAIJ.

Z. W. Reilsberg, VKSAIJ.

Reilsberg, VKSAIJ.

Z. W. Reilsberg, VKSAIJ.

Z

Broadcast Committee
W E Roper, VKSARZ,
J P Downie, VKSAPD,
P E Linden, VKSAPD,
C. B Edmonds, VKSARZ
L. H. Poynter, VKSZGF W1.C.E.N. Co-ordinators
J. B. Battrick, VK3OR,
M. J. Owen, VK3ZEO.

W.I.C.E.N. State Controller: H. L. Hep-burn, VKMAFQ. WICEN. Tech. Co-ord. J. W. Spicer, YRIZEL YRC Equip Officer V Barnes, VK3OT.

YR.C Equip Officer: V Barnes, v Property Officers: J. I. Kelleher. VK3AIJ. J. I. Kelleher. VK3AIJ. T. J. Cuthbertson, VKZZIQ. T. V. Committee: W. M. Elec. VK3ABP. G. Farthing, VK3AFR. J. A. Taylor, VK3ZJF.

Other matters discussed included improved ghting in the rooms, space for F.E. records, ublicity for meetings and non-return of lib-

inhibited in the books piece for Peri Police.

For The Solds.

WESTERN ZONE

The Wednesday evening zone hook-up has been suffering from the vagaries of 80 metre propagation during the past few weeks but numbers on seem to have been up to average. Bert 3EF and Herb 3NN are still the most regular, with 3AKW when shifts allow and the farmers when they aren't out their

that shallment were users of world-shaking importance. Bay 3ATN is certainly the greatest doer in the soon at present with 452 Me and the shall be shall be



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Hoy and 3AFU, 3KT have been keeping the sg flying on 2 fm. but 3AFU, 3KT had a ower supply disintegration on the fm. base t and at the moment are forced to operate t the ridiculous, as opposed to the sublime, most

Jido metre signalis ace now ever good AMUTA coppele SARC, MACE, NN. B. Bellow AMUTA coppele SARC, MACE, NN. B. Bellow AMUTA coppele SARC, MACE, NN. B. Bellow Me never hear for some stations on 40 and we haven't heard from the DA Nounds in the coppele SARC of the Medical Sarch Mace and the coppele SARC of the Medical Sarch Mace and the cover? We get two "A.B." each month. We are willing to let one go to cover? We get two "A.B." each month. We are willing to let one go to month. We are willing to let one go to the sarch Mace and the sarch Ma

better, we'll have more should had not been considered. The service of the servic

in tanks. Easy Jim, just bresails. Jim's shack has not en he gets the sunroom bullt jobs done, and the snalls we may be rewarded with t, from the QTH of Jim KE, r attender at our meetings as founders of the Club.

Way back in November, 1949, President J. Keenes KE, Treasurer E Manifold KM and Amateur Radio, July, 1965 Servicery E. Scott. As a matter of interest the club suberpities was 10/2 per year and meetings were held at the Moorabbin Town Jall for quite some considerable period. The present subscription is £1 per year. 13/- for a till looking after his XYL, in ward one due to a bit of ill-health himself has not been heard as regularly on two F.M. As mentioned in the notes last month, a Social Evening was held at the QTH of Eddle As usual, an enjoyable evening was spent by all.

spent by sil.

That is all for the mouth, and is round it

That is all for the mouth, and is round it

all of club Officers for 1882;

but of Cub Officers for 1882;

but of Cub Officers for 1882;

but of Cub Officers for 1882;

but officers for 1

73, VK3XK.

QUEENSLAND

The security of the control of the c

pennance ections.

is anticipated that news sessions on six is anticipated by VX6WL very case will be resumed by VX6WL very lly and this will be welcomed by the v.h.f. group.

VK4XP is to resume slow morse on 3804
Mcs. at 1930 hours on Mondays and Thursdays. Weeker as 18th house more on minds as a large in the case of the c

BUNDABERG AMATEUR RADIO CLUB OURDANGERO AMATEUR RADIO CLUB Operation Tannum Sands Lux advance party travelled to Tannum Sands last week-end to ment members of the Central Queenaland Branch on the spot, and together they assessed the potential of the locality, and thoroughly "cased" the plot. "case" the join.

It is a many a many

contact Rusty VKAIM.

This Tannium Sands convention has really got the six metre boys busy around our QTH.

Robert YKAIM has been beard being a fix Robert, but no doubt the de-louing is only a matter of time. A blue panel van with a 7 mag whip mounted, which resonates very well on 30 Mes. is reaming around carring well on 30 Mes. is reaming around carring

the daylights out of everyone doing over 25 mp.h. The designer of the rig is still trying to find out why? Mex. comes out at 35 Mex. I sell you this rig had the Youth Chib lafe the stack. They thought Scott McLead et Space Angel fame had arrived. Then another monetar arrived. A 8 metre beam perched on pace Angel fame had arrived. Them shedher nonsiter arrived. A 6 metre heam perched on op of a sedan car, the only thing missing was the identification marking XLS. John VKKXC is beary putting the finishing ouches to a 49 watt final for his six metre ig also.

An ex-club member and student, George

rig also.

An ex-chib member and shident, George
VKCRIG has been seen back in our Till of
VKCRIG has been seen back in our Till of
vKCRIG has been seen back in our Till of
vKCRIG has been seen back in our Till
souther chib member, has just completed a
norme with DCA. in Brishant. Len VKELI, on
in at Calpour, Bliedis.
Those who stiended last month's meeting
citib member, Les VKECI, on the producing
of T.V. programmes, etc. Les is always eary
to liken is, and we appreciated this visit very blutter to, and the state of the more putting every fort fato preparing themselves for the more est later this year. Every lunch hour finds hem at the shack with key and ostellator

Tests. Class I terry keen and the Tests Class. Class II terry keen and the Tests Class II terry keen and the course, crystal sets and continuity tester. Less work reconstance theory was their task and The Youth Club urpently requires more parts for construction projects; parts needed are as the continuity tester to the continuity tester to the continuity of the continuity of the continuity of the continuity tester to the continuity tester to the continuity of the continuity o

SOUTH AUSTRALIA

The S.A. Division southly meeting varied to The S.A. Division southly meeting varied to The S.A. Division southly meeting to the Control of State o

a much more word pattern of the scene base more than the more holded comes field to mighty selfides above, including comes field to mighty selfides above, including comes field to mighty selfides above, including comes field to mighty selfides and the mighty selfides to might selfide the mighty than the mighty selfides the might selfides the mighty selfides the might selfides the mighty selfides the mighty selfides the might selfides the mighty selfides the might selfides the might selfides the might selfides the mighty selfides the mighty selfides the mighty selfides the mighty selfides the might selfides the mighty selfides the mighty selfides the mighty selfides the might selfide the mighty selfides the mighty sel

resumed. Have not heard a whisper from the old so-und-to since he went sway, not even an AM contact this year, so don't know what he has been up to but no doubt he will let forth next month and bring us up to date.

No doubt you all know Ken IAFJ, who apart from being the blue-penciller on "A.R" (boy

level i mifered in that regard) has been on the receiving end of many a guid from Frany. Well mew let it be indexly stated that he, Ken, has been appointed president of the VKZ Division. The president of the president of the VKZ Division, has well have to be addressed as Mr. Ken and will be entitled to more than the usual cour-tory extended him to PP. The contract of the three president of the president of the president has defined in the president of the president has defined to be to extend the hand of friendship before France stall into you, on please for at least one menth don't think for your blood being like-right Banelle and

were constrained the breddy of country of the control of the country desired in t

Fight, or the secretary through the turned chan-The Sunday convenience sull-head on a has The Sunday convenience sull-head on the country members, although they do predomi-nate but quite in the coverage of the interesting in regard to the coverage of the interesting in regard to the coverage of the continue. Lance EM, as Cleav very sublem-son, and the coverage of the coverage of the production. Lance EM, as Cleav very sublem-mental that the coverage of the coverage of the coverage of the coverage of the substantial coverage of the coverage

Clem SWG in a recent contact described an even queerer antenna than usual in that it whether to call it a "water place" or not, it was something like the Larson E. Rapp job where the antenna was buried and the something the contact of the contact

sign.

The control of the control of

for for the same reason. The most recent complaint of a task and that times it is not on the bands, is one from the would, i.e., plets the concepting around the bouse that lad to wait writer antennas, exclure, ga-pleted the concepting around the blues that it is now possible to wait around the place appropriate the same around the place expressey without getting the shoes dirty. Mrs. 525 is of course delighted, but is it so that Mill can have another project on the safet for years to come. Good latt to year

farts for years to come. Good Reas we well to the Centre things are moving along quite well, where \$ECK has now become \$4AV, taking Experies old call, and will soon be to be the voles of the Centre on most of the frequencies, and is not to give a contact on the control of the model you request, including as, and of the model you request, including as, and of the control of the c

allow actives: that when Les UTC total make any control of the con

have been deleted in anticipation.

Naturally you are "desting with the strength" by going sideband, don't delay the decision, for if not now then you will later on, so why not be in it right away. Last mouth I mentioned that file VK's were on this mode, well in the four weeks since then it has climbed to 625 and is still going, it is easy

Repairs to Receivers, Transmitters; constructing and testing; xtal conv., any frequency; Q5-ers, R9-ers, and transistorised equipment.

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a.b.

one, yes well keep it out here all more and a second property of the property

13, Comps VK5EF.

TASMANIA

seems very scarce indeed this month, expect the editor will be pleased in

The Manusch of the Company of the Co

there will be this time next year.
Victor King Seven Ear Basher has be and still is, on the sick list, and is at prespeedy and complete recovery Ted, and your behalf may I invite friends to visit, to help break the monotony a bit. What worry on that score the property on the property of the property worry on that score. Brian 1725 was been grant to be grant to the grant to be grant to be

appearing and so on.
ratulations to Bob (TKZ ex-TZBK) on
his C.w. and also to Mike (TZMC) on
the limited ticket. d ticket.

was not much news this
Ian (TZZ) can find a bit
when he deputies for me.
TI's, Geoff (TZAS). more next time

NORTH-WEST ZONE

NORTH-WEST ZONY

Over a first train how good to the content person of the content person with income of the content person with income of the content person with the conor NAL mobile extended wery attended to
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WANTED: UM3 "Woden" MT15A or similar multitap, 75 watt or more, modulation transformer; also modula-tion transformer from SCR522 trans-mitter. P. Garde, VK3ZDF, 154 East Boundary Road, East Bentleigh, Vic. 57-4393.

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Minimum 5/-, for thirty words. Extra words, 2d, each, Advertisements under this beading will be accepted only from Amsteurs and S.w.l's. The Publishers reserve the right to reject any commercial nature. Copy must be received at F.O. Bax 36, East Melbourne, C.S. Yie, by 8th af the month and remittance sheald accompany the advertisement.

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